

Symposium E

POSTER SESSION PE1 - MONDAY, OCTOBER 9

E501 - INDUCED CHANGES ON THE OPTICAL PROPERTIES OF SOL-GEL MATRICES DOPED WITH HIGHLY ACIDIC METHYL RED

Jordan Del Nero (Departamento de Física; UFPA, 66075-110, Belém, (PA)), Rudson Ferreira (Departamento de Física; UFPA), Rodrigo Monte Gester (Pós-Graduação em Física, UFPA) and Sheila Cristina Santos Costa (Pós-Graduação em Eng. Elétrica, UFPA)

Methyl Red was successfully incorporated in its acidic form within the host matrix, leading transparent self-standing films. The theoretical methodology was based in quantum mechanics calculations performed on statistically uncorrelated structures of liquid (Methyl Red + 67 water molecules on first solvation shell) generated by Monte Carlo simulation. Our results reveal a different electronic pattern for the highly acidic forms of Methyl Red supported by spectroscopic investigation.

E502 - PROTOTROPIC PROCESSES IN GLASSES AND IN SOLID MATRICES

Mário José Politi (IQ-USP) and Fátima Chagas da Silva (IQ-USP)

Photoacid activities of 2-Naphtol and of Piranine were investigated in sol-gel monoliths and in solid state buffers. It was found that the occurrence of excited state proton transfer depends on the presence of residual water even in the presence of large amounts of a strong close by Brønsted base. The results are rationalized in terms of the nanosized dimensions for the proton to escape from the Debye cage. It is shown the requirement of a mobile specie to solvate the proton allow it to diffuse from its partner. These are discussed in basis of known proton conductance in various glasses.

E505 - HYBRID SILICA MODIFIED BY METHACRYLATE GROUPS AND USED AS FILLER IN RESIN

Eduardo José Nassar (UNIFRAN), Paula Santos Pereira (UNIFRAN), Lilian Rodrigues Ávila (UNIFRAN), Evelisy Oliveira Nassor (UNIFRAN), Paulo Sérgio Calefi (UNIFRAN) and Kátia Jorge Ciuffi (UNIFRAN)

Organic-inorganic hybrid materials used as composite fillers in dental resins can be obtained through the sol-gel process. Modifying silica surfaces with organic material confers on them the physical characteristics of the support and the chemical properties of the organic phase, and also promotes adhesion between the inorganic filler and the resin matrix.

E506 - SYNTHESIS OF SILICON OXIDE MODIFIED WITH CALCIUM AND PHOSPHORS FOR BIOAPPLICATIONS

Eduardo José Nassar (UNIFRAN), Katia Jorge Ciuffi (UNIFRAN), Cesar Mello (UNIFRAN), Lilian Rodrigues Ávila (UNIFRAN), Paulo Sergio Calefi (UNIFRAN) and Lucimara Capelozi Bandeira (UNIFRAN)

The development of new materials synthesization techniques has opened

up a large field for applications in biomaterials. The sol-gel process can be applied to many inorganic phases, particularly with silicon oxide. The study reported here involved the preparation of a silicon oxide containing calcium and phosphors for bioapplications, using the sol-gel route. In this study, silicon oxide was prepared by the sol-gel method, using tetraethylorthosilicate (TEOS) as the precursor. The calcium and phosphor sources used here were alkoxide and phosphoric acid, respectively, in ethanol solvent.

E509 - ION TRANSPORT IN DECOUPLED HYBRID ORGANIC-INORGANIC POLYELECTROLYTE

Flavio Leandro de Souza (UFSCar) and Edson Roberto Leite (UFSCar)

In this work we described the chemical synthesis strategy to obtain helical free chain configuration of a single-phase hybrid organic-inorganic polymer electrolytes leading to a good Li ion conductivity at room temperature ($\sim 10^{-5}$ ohm.cm⁻¹). This hybrid organic-inorganic polymer electrolyte (polyelectrolyte) showed activation energy of 0.23 eV, indicating a fast ion transport mechanism. Such characteristics indicate a fast ion transport mechanism in a segmental motion decoupled behavior is reported for a hybrid polyelectrolyte.

E510 - SYNTHESIS OF DIAMOND FILMS THROUGH GRAPHITE ETCHING IN A HOT FILAMENT CVD REACTOR

Jeronimo Santos Travelho (INPE), Mauricio Ribeiro Baldan (INPE), Erica Cristina Almeida (INPE), Adriana Faria Azevedo (INPE), Neidenei Gomes Ferreira (INPE) and William Melo Silva (INPE)

Diamond particles and films were growth on P-type (100)-oriented silicon wafers using hot-filament CVD method with a pure hydrogen feed. Scanning electro microscopy and Raman microprobe techniques were used to investigate the growth rate, quality and morphology. The results are discussed with respect to temperature and pressure dependence. The quality, morphology and growth rate has a strong dependence with the substrate temperature. At a substrate temperature of 600 0C the highest growth rate ($\sim 1\mu\text{m/h}$) and the best quality of diamond coating were obtained at the pressure of 20 torr.

E511 - X-RAY DIFFRACTION AND RAMAN MICROPROBE TECHNIQUES FOR CRYSTALLITE SIZE LA DETERMINATION ON RETICULATED VITREOUS CARBON

Mirabel Cerqueira Rezende (AMR/CTA), Emerson Sarmento Gonçalves (AMR/CTA), Adriana Faria Azevedo (INPE), Érica Cristina Almeida (INPE), Maurício Ribeiro Baldan (INPE) and Neidenei Gomes Ferreira (INPE)

This paper presents a systematic study of the ratio between the intensities of the disorder-induced D and G band and X-ray diffraction for the determination of the crystallite size La on reticulated vitreous carbon (RVC) treated at different temperatures (HTT).. This study compares the information provide by both techniques and check the validity of the commonly used formula of Tuinstra and Koenig and Cañçado et al. The two techniques show an apparent concordance at HTT higher than 1300 °C

E512 - NATURE OF POTENTIAL BARRIER IN (Ca1/4 Cu3/4) TiO3 POLYCRYSTALLINE PEROVSKITE

Jose Arana Varela (UNESP), Paulo Roberto Bueno (UNESP), Mario Cilense (UNESP), Vicente Borges Marques (CEFET-MA) and Elson Longo Silva (UNESP)

The origin of nonohmic electrical features of (Ca₁=4,Cu₃=4)TiO₃ perovskite ceramics is believed to be caused by potential barriers at grain boundaries .In the present work we used impedance spectroscopy technique to study (Ca₁=4,Cu₃=4)TiO₃ perovskite ceramics presenting low nonohmic properties. The study was conducted in two different conditions: for ceramics as-sintered and after thermal treatment at oxygen-rich atmosphere. The results confirm that the thermal treatment at rich oxygen atmospheres influences the nonohmic

E512 - NATURE OF POTENTIAL BARRIER IN (Ca1/4 Cu3/4) TiO3 POLYCRYSTALLINE PEROVSKITE

Vicente Borges Marques (CEFET-MA), Mario Cilense (UNESP), Paulo Roberto Bueno (UNESP), Jose Arana Varela (UNESP) and Elson Longo Silva (UNESP)

The origin of nonohmic electrical features of (Ca₁=4,Cu₃=4)TiO₃ perovskite ceramics is believed to be caused by potential barriers at grain boundaries .In the present work we used impedance spectroscopy technique to study (Ca₁=4,Cu₃=4)TiO₃ perovskite ceramics presenting low nonohmic properties. The study was conducted in two different conditions: for ceramics as-sintered and after thermal treatment at oxygen-rich atmosphere. The results confirm that the thermal treatment at rich oxygen atmospheres influences the nonohmic

E513 - PREPARATION AND CHARACTERIZATION OF SILVER HEXACYANOFERRATE/CONDUCTING POLYMER NANO COMPOSITE

W M de Azevedo (UFPE), M C C. Areias (UFPE), I L de Mattos (Ufpe) and M Navarro (UFPE)

Silver hexacyanoferrate(II)/polyaniline (PANI) composites films has been synthesized by a new route using a dialysis membrane as a solid support. The silver hexacyanoferrate(III) compound is used as oxidant to polymerize the aniline monomer. The spectroscopic, X-ray and SEM measurements show that the composite remains conductive, optically active and has a crystalline tetragonal structure with dimension of 1 μm by 4μm. After the reaction with aniline the structure remains the same and silver nano wire structure of 140nm wide by several μm of length grows on the top of the composite.

E515 - STUDIES ON ELECTRICAL PROPERTIES OF POLYPYRROLE/LA2O3 COMPOSITES

S C Raghavendra (UFPA), Victor Dmitriev (UFPA), T K Vishnuvardhan (Gulbarga University), V R Kulkarni (Gulbarga University) and C Basavaraja (Gulbarga University)

– Polypyrrole (PPy)/La₂O₃ composites were synthesized by in-situ polymerization. The effect of La₂O₃ content on the electrical properties of PPy/La₂O₃ was investigated. The ac conductivity of composite samples were studied in the frequency range of 10² to 10⁶ Hz. The composite samples reveal ordered semi-conducting behavior. Also dielectric behavior of the composites at room temperature has been studied. Conducting polymer composites are the conjugated macromolecules, their electronic structures

and their electrical properties change as they are reduced or oxidized. Such conducting polymer composites exhibit more advantages than, the single components in terms of mechanical, chemical, electromagnetic and other properties. Most of the conducting polymer composites are blended with one or more insulating materials, so that their desirable properties are combined successfully resulting in some significant improvement in different physical properties of the conducting polymers. Among many conducting polymers Polypyrrole is considered as a promising candidate for many applications, like rechargeable batteries [1], thin films [2], transistors [3], electromagnetic shielding [4] etc. The frequency dependent electrical conductivities of PPy/La₂O₃ composites have been presented in the figure 1. The most interesting observation is that the ac conductivity of few composites is significantly higher than the bare polymer, in spite of the fact that La₂O₃ is an insulating material at room temperature (9.45224 ·10⁻¹⁰ S/cm), whereas for the 10 weight percentage composite, it is found to be 1.854 ·10⁻⁴ S/cm. It is also found that conductivity is smaller for larger weight percentage of La₂O₃ in the polymer composite. Dependence of dielectric constant as a function of frequency ranging from 100 to 10⁶ Hz at room temperature for the pure PPy and its composites is plotted in figure 2. The inset this figure shows dielectric constant as a function of frequency for pure PPy. In both the cases of pure PPy as well as for the composites, the dielectric constant shows steep decrease from its initial higher values. Above 10⁴ Hz the dielectric constant remains nearly the same. In conclusion PPy/La₂O₃ composites are prepared by dispersing different amount of La₂O₃ particles in polypyrrole matrix. The increase in the ac electrical conductivity of the PPy/La₂O₃ composites over pure PPy is due to macroscopic conductivity. PPy/La₂O₃ composites with minimum weight percentage of La₂O₃ show higher conductivity than pure PPy due to increased orderness in the composites. Increase in the values of dielectric constant may be due to interface between the oxide and the polymer increases the orderness and the packing density. Also maximum space charge (Maxwell Wagner) polarization helps in increasing the dielectric constant. The semicircles of the Cole-Cole plots suggest the dominance of Debye type relaxation in these composites. Relaxation times are seen to get shorter with increasing content of oxide. It suggests multiple paths for the system to relax due to the diffusion of polarons and bipolarons. These preliminary studies help us in understanding the basic behavior of composites to explore applications like EMI applications, microwave absorbers, conductive paints, rechargeable batteries, sensors and actuators.

E516 - SOL-GEL DERIVED COMPOSITE FROM BIOACTIVE GLASS-POLYVINYL ALCOHOL

Hermes S Costa (UFMG), Vilma C Costa (UFMG), Marivalda P Magalhães (UFMG), Rodrigo O Lambert (UFMG), Wander L Vasconcelos (UFMG) and Herman S Mansur (UFMG)

Bioglasses have been used for the repair and reconstruction of diseased bone tissues, as they exhibit direct bonding with human bone tissues. However, bioglasses have low mechanical properties. On the other hand, composite materials of biodegradable polymers with inorganic bioactive glasses are of particular interest to engineered scaffolds because often show an excellent balance between strength and toughness. The goal of this work was the synthesis of glasses obtained by the sol-gel method modified with PVA and characterized by the mechanical behavior with axial compression test.

E517 - INCORPORATION OF PHENYLTRIEHOXYSILANE IN SILICA OBTAINED BY THE SOL-GEL ROUTE

Eduardo José Nassar (UNIFRAN), Alexandre Cestari (UNIFRAN), Paula Fabiana dos Santos Pereira (UNIFRAN), Evelisy Cristina de Oliveira Nassor (UNIFRAN), Lilian Rodrigues Avila (UNIFRAN), Katia Jorge Ciuffi

(UNIFRAN) and Paulo Sergio Calefi (UNIFRAN)

Silica glasses obtained by the sol-gel method have been thoroughly investigated over the last decade. This paper describes the synthesis and characterization of europium III-doped silica xerogels (powder) prepared by the conventional sol-gel process. Silica sol was prepared from tetraethylorthosilicate (TEOS) in ethanol with phenyltriethoxysilane (PTES) in molar ratios of 1:1 and 0:1 and homogenized by magnetic stirring.

E518 - SYNTHESIS, CHARACTERIZATION, AND IMPROVEMENT OF LITHIUM ION INTERCALATION OF V2O5/WO3 XEROGEL COMPOSITE FILMS

Aline Turini Bolsoni (FFCLRP - USP) and Herenilton Paulino Oliveira (FFCLRP - USP)

The demand on electrode material, which undergoes lithium intercalation in electrochemical cells and electrochromic devices, is a challenging task. In this context, we synthesized V2O5/WO3 xerogel composites using soft chemistry approach and investigated their electrochemical properties. It was observed that the presence of WO3 xerogel leads to low decrease of the total charge upon electrochemical process, thus favouring the process of lithium electroinsertion. Moreover, the synthetic route adopted herein is a simple and low-cost alternative for the preparation of composites and mixed oxides.

E570 - OPTICAL CHARACTERISTICS OF SOL-SEL SILICA ADDITIVED WITH FORMAMIDE AND DOPED WITH COBALT

Wander Luiz Vasconcelos (UFMG), Herman Sander Mansur (UFMG), Vilma Conceição Costa (UFMG) and Nelício Faria de Sales (UFMG)

In this work we have evaluated the influence of concentration of precursors and temperature of process on structural properties of sol-gel silica additived with low concentrations of formamide and doped with cobalt. The temperature influence on the VIS-NIR transmission was observed on the sample doped with cobalt. Samples were heated at 90 oC and at 120 oC and presented molar ratios of TEOS/formamide of 1/0.004, 1/0.013, 1/0.038 and 1/0.064. The molar ratio of TEOS/H2O/EtOH/HNO3 used for the four samples was 1/3.8/3.8/0.01. The first sample (TEOS/Formamide= 1/0.004), was doped with cobalt.

E519 - EFFECT OF NICKEL ACETATE CATALYST ON THE NUCLEATION OF NANOSTRUCTURES IN SILICON OXYCARBIDE GLASSES

Inez Valéria Pagotto Yoshida (UNICAMP) and Mariana Gava Segatelli (UNICAMP)

In this work, poly(methylsiloxane)/divinylbenzene was used as preceramic hybrid polymer to obtain SiCxOy glasses enriched with aromatic carbon phase by pyrolysis technique. Morphology of fractured surface of PMS/DVB 50:50 pyrolysed samples at 950°C presented cracks and pores uniformly distributed in the amorphous silicon oxycarbide matrix. On the other hand, the samples pyrolysed at 1500°C are denser and characterized by bonded globular particles. The silicon oxycarbide glasses obtained from Ni-containing polymeric precursors presented an interesting morphology, rich in nanowires.

E521 - CHARACTERIZATION AND ELECTROCHEMICAL STUDIES OF THE INTERCALATED POLI O-METHOXYANILINE INTO MESOSTRUCTURED V2O5

Herenilton Paulino Oliveira (FFCLRP-USP) and Elidia Maria Guerra (FFCLRP-USP)

POMA was intercalated into mesostructured V2O5 using surfactants CTAB and HDA. The presence of lamellar structure of the matrix leads to the possibility to insert polymeric species and consequently, obtain a hybrid compounds with unique properties. V2O5/POMA presented a variation in the interlayer spacing and low intensities peaks, suggesting a decrease in crystallinity with respect to the matrix. In the cyclic voltammetry data was observed an improvement in the electrochemical stability and a low total charge variation in comparison with the matrix during lithium ions insertion.

E522 - ELECTROCHEMICAL CHARACTERIZATION OF THE DIAMOND/CARBON FIBER ELECTRODE AS AN ELECTRICAL DOUBLE-LAYER CAPACITOR

Vladimir Jesus Trava-Airoldi (INPE), José Mauricio Rosolen (USP), Mauricio Ribeiro Baldan (INPE), Adriana Faria Azevedo (INPE), Érica Cristina Almeida (INPE) and Neidenê Gomes Ferreira (INPE)

In this work, a diamond/carbon fiber electrode has been developed for using as an electric double-layer capacitor. Morphological and electrochemical results of boron doped diamond films grown on carbon fiber substrates treated at three different heat treatment temperatures are discussed as well as their electrochemical response by cyclic voltammetry and constant current charging/discharging. The diamond/carbon fiber exhibited a wide electrochemical potential window (ca. 2.0 V) and high energy densities (19 mJ.cm-2) that is dependent of the structural of the carbon fibers.

E523 - EFFECTS OF THE ALUMINA ADDITION IN THE MICROSTRUCTURE OF FOAM GLASS

Andrea Pokorny (UFRGS) Juliane Vicenzi (UFRGS) and Carlos Pérez Bergmann (UFRGS)

In this work, the influence of the Al₂O₃ addition in the microstructure of foam glass has been studied. Alumina was introduced to the mixture in order to increase the refractoriness of the product. Optical microscopy and scanning electron microscopy were used to study the microstructures of the resulting materials. The results have shown that the addition of alumina in the ceramic body resulted in pores with thicker walls and a lower volumetric expansion. The insertion of this phase makes the glass more viscous, thicker and more resistant to the deformation and rupture.

E524 - PHOSPHOTUNGSTATE-APTS HYBRIDS WAVEGUIDES

Younès Messaddeq (UNESP), Francisco Audisio Dias Filho (UNIEURO), Rogéria Rocha Gonçalves (USP), Anne Jacqueline Barbosa (UNESP) and Sidney José Lima Ribeiro (UNESP)

Eu³⁺ doped polyphosphate-tungstate and polyphosphate-APTES hybrids thin films were prepared using dip-coating and spin-coating techniques. Thin films were characterized by FTIR and RAMAN spectroscopy. The optical parameters like refractive index, thickness and attenuation were evaluated by prism coupling technique. Eu³⁺ spectroscopic properties were measured as a function of compositions.

E528 - ADSORPTION OF PHENYLALANINE ON LAYERED DOUBLE HYDROXIDES: EFFECTS OF TEMPERATURE AND IONIC STRENGTH

Fabiano Silvério (FFCLRP-USP), Marcio José dos Reis (FFCLRP-USP), Jairo Tronto (FFCLRP-USP) and João Barros Valim (FFCLRP-USP)

Layered Double Hydroxides (LDHs) are intercalation-type materials utilized in the adsorption and/or sorption of anionic species. Its structure can be described as positively charged planar layers constituted of divalent and trivalent cations in the centre of edge-sharing octahedra. This positive charge is compensated by interleaved anions. This work reports the adsorption of phenylalanine (Phe) anions in Mg-Al-CO₃-LDHs, as a function of the ionic strength and temperature. The results presented interesting characteristics, providing a good way to remove and recover Phe coming from wastewaters.

E630 - SYNTHESIS OF NICKEL NANOPARTICLES EMBEDDED INTO MESOPOROUS SILICA-CARBON MATRIX FOR APPLICATION IN HETEROGENEOUS CATALYSIS

Ariovaldo Oliveira Florentino (IBB-UNESP), Juliana Catarina Bruno (IBB-UNESP) and Alberto Adriano Cavalheiro (IBB-UNESP)

The preparation of nickel nanoparticles into silica-carbon matrix composites by using the polymeric precursor method was investigated in this work. The characteristics of the mesoporosity and the dispersion of nickel nanoparticle into non-aqueous amorphous silica-carbon matrix containing nanosized nickel particles have been investigated by adsorption/desorption isotherms and TEM.

E532 - N-PROPYLPYRIDINIUM CHLORIDE MODIFIED POLY(DIMETHYLSILOXANE) POLYMER: STUDY OF METAL ADSORPTION FROM ETHANOL SOLUTION

Yoshitaka Gushikem (Unicamp), Inez Valéria Pagotto Yoshida (Unicamp) and Fábio Luiz Pissetti (Unicamp)

Materials based on silicones have been studied on many different areas, mostly because of the singular characteristics of these polymers. The Poly(dimethylsiloxane) is the most studied on academic and technological researches. In this work an elastomeric polyelectrolytic network was obtained from poly(dimethylsiloxane) and n-propylpyridinium chloride. This material showed high adsorption potential and chemical stability. Structural analysis was performed by infrared spectrum, HPDEC 13C NMR and TGA. Coordination ability was studied by adsorption isotherms of metal halides in anhydrous ethanol.

E533 - V2O5-AL₂O₃ XEROGEL COMPOSITE: SYNTHESIS, CHARACTERIZATION AND PROPERTIES

Thiago Ferreira Luz (FFCLRP-USP), Glauciane Nascimento Barbosa (FFCLRP-USP) and Herenilton Paulino Oliveira (FFCLRP-USP)

V₂O₅-Al₂O₃ system has been the subject of many studies dealing with vanadium oxide dispersion, surface structure and potential technological applications such as catalytic processes. In this context, the main objective of this work consists in reporting new experimental results concerning the preparation of vanadium oxide-aluminium oxide composite xerogel by soft chemistry approach. The Al₂O₃.nH₂O provides insolubility to the V₂O₅ xerogel in both aqueous and non-aqueous media and the composites

possess electrochemical behavior, which is very similar to that observed in pure V₂O₅ xerogel.

E534 - ORGANICALLY MODIFIED LAYERED SILICATES OBTAINED BY GRAFTING OF AMINO-MERCAPTO SILANE COUPLING AGENT

Wander Luiz Vasconcelos (UFMG), Angela de Mello Ferreira Guimarães (CEFETMG) and Virgínia Sampaio Teixeira Ciminelli (UFMG)

This work describes the process for functionalization of smectite through covalent grafting of organic ligands containing thiol (-SH) and amine (-NH₂) to the external surface and interlayer silanol groups. It was observed that the modification resulted in smaller porosity and increased hydrophobicity depending on the amount of functional groups attached to the clay structure. Analyses by XRD showed that the silylation process did not affect significantly the crystallographic structure of the clay and silylation took place at the surface of the particles in a case of mercaptopropyl, while the immobilization of the aminopropyl happened in within the interlayer galleries.

E538 - CARBON BLACK FILLED EPOXY COMPOSITES MEASURED BY DIELECTRIC IMPEDANCE SPECTROSCOPY AND DC CONDUCTIVITY TECHNIQUES DURING THE CURE PROCESS

Carlos Alberto Baldan (EEL-USP), Alain Laurent Marie Robin (EEL-USP), Mariane Martim Sobrosa Passos Abreu (EEL-USP), Ana Carolina Miguel Marques (EEL-USP) and Carlos Yujiro Shigue (EEL-USP)

In this work we prepared carbon black-filled epoxy composites using different carbon black ratios below and above the percolation limit and the samples were characterized during the cure process by dielectric impedance spectroscopy and by DC conductivity. The results present distinct behavior during the cure process because of the effect of the conducting filler on the matrix microstructure. Filled samples below the conductive percolation threshold should be monitored by dielectric spectroscopy analysis whereas samples above that limit displays conductive behavior during all the curing stages.

E539 - MAGNETIC PROPERTIES OF COICUI MOLECULAR CHAIN INCORPORATED IN VYCOR GLASS

Danielle Cangussu de Castro Gomes (IQ-UNICAMP), Wallace de Castro Nunes (IFGW-UNICAMP), Marcelo Knobel (IFGW-UNICAMP), Humberto Oório Stumpf (DQ-ICEX-UGMG), Italo Odone Mazali (IQ-UNICAMP) and Oswaldo Luiz Alves (IQ-UNICAMP)

The magnetic properties of the nanocomposite obtained by synthesized of CoIICuII molecular chain, namely [CoCu(opba)], opba = ortho-phenylenebis(oxamato), into porous Vycor glass (PVG) by reaction of the precursor (NBu₄)[Cu(opba)] and cobalt acetate has been studied. The characterization confirm the effective formation of [CoCu(opba)]_x into the pore environment of PVG. The magnetic behavior of the nanocomposite obtained indicate a collective spin reversal of the ferrimagnetic chains limited by the nanoporous size, leading to a slow relaxation of the magnetization at low temperatures (< 5K).

E541 - ACCOMPANIMENT OF LINSEED OIL POLYMERIZATION BY THERMAL DEGRADATION AND ¹³C NMR

Roseany Vasconcelos Vieira Lopes (UnB), Maria José Araújo Sales (UnB), Maria Lucília Santos (UnB) and Inês Sabioni Resck (UnB)

The researches for polymers obtained of renewable resources and natural sources are increasing and justified for the world tendency of obtaining cheap, biodegradable and no pollutant polymers. In this study was to accompany the thermal polymerization of linseed oil by thermogravimetry (TG) and ¹³C nuclear magnetic resonance (NMR). The materials were prepared using two different formulations. The results by TG showed that the materials have larger thermal stability. The characterization for the NMR showed that the polymerization happened through the olefinic carbons.

E543 - COATING PARAMETERS OF HFCVD-DIAMOND ON POROUS TITANIUM

Neila de Almeida Braga (INPE), Carlos Alberto Alves Cairo (CTA) and Neidenêi Gomes Ferreira (INPE)

Porous titanium has not yet been used as substrate for diamond films growth. In this work these substrates were produced by powder metallurgy in order to control the porosity and to reduce the Young Modulus. Hot filament chemical vapor deposition parameters of diamond on porous titanium has been studied by varying substrate surface temperature, filament distance to substrate surface, methane concentration and time deposition. Diamond/Ti films characterization was made by using Raman spectroscopy, Scanning Electron Microscopy and X-ray Spectroscopy.

E544 - DIELECTRIC RESPONSE AND RELAXATION PHENOMENA IN AG /EPOXY RESIN NANOCOMPOSITES

Leandro A. Ramajo (INTEMA (CONICET-UNMdP)), Miriam S. Castro (INTEMA (CONICET-UNMdP)) and Maria M. Reboledo (INTEMA (CONICET-UNMdP))

The influence of silver nanoparticles on dielectric behavior of epoxy matrix was studied. Silver was produced through AgNO₃ chemical reduction in ethanol and triethylenetetramine. The resulting solution was mixed with the epoxy matrix to prepare the nanocomposites. Dielectric measurements showed that dielectric constant of composites depended on the filler amount, the temperature and the frequency. Dielectric losses were also influenced by the temperature and by the frequency through relaxation process, even though volume fractions did not have influence on losses.

E545 - BIOCOSCOMPOSITES BASED ON BIOACTIVE SOL-GEL GLASSES AND POLY(VINYL ALCOHOL)

Vilma C Costa (CETEC), Hermes S Costa (UFMG), Wander L Vasconcelos (UFMG), Marivalda M Pereira (UFMG), Rodrigo L Oréface (UFMG) and Herman S Mansur (UFMG)

SiO₂-CaO-P2O₅-PVA organic-inorganic hybrids were synthesized by foaming a mixture of polymer solution and bioactive glass sol-gel precursor solution. The effect of composition and synthesis conditions on the porosity and properties of the hybrid composites were analyzed by thermogravimetric analysis, SEM, porosity and density measurements. The absolute density values measured for the samples ranged from 0.42 to 0.52 g/cm³. These hybrid materials are proposed to find application as bioactive and biodegradable scaffolds in bone tissue engineering.

E546 - STRUCTURAL ATOMIC MODEL FOR SURFACE RECONSTRUCTIONS OF MNAS ON GAAS(111)B

B. B. Lipinski (PIPE - UFPR), D. H. Mosca (PIPE - UFPR), A. Ouerqui (INSP - UPMC), M. Marangolo (INSP - UPMC), M. Eddrief (INSP - UPMC), D. Demaille (INSP - UPMC), V. H. Etagens (INSP - UPMC), M. Lazzeri (IMPCM - UPMC), H. Cruguel (LURE - CUP-Sud), F. Sirotti (LURE - CUP-Sud), A. Coati (LURE - CUP-Sud) and Y. Garreau (LURE - CUP-Sud)

A multi-technical approach has been used, combining STM, XPS, GIXD measures and ab initio calculations, to investigate surface reconstructions of MnAs (0001) epilayers. An atomic structural model has been proposed for the (2x2) and the (3x1) reconstructions. STM observations and ab initio calculations show the (2x2) phase constituted by As-trimers adsorbed on an underlying Mn-layer of bulk MnAs, while X-ray diffraction analysis coupled with STM, shows that the (3x1) reconstructed surface is constituted of long and narrow As chains aligned with the <110> GaAs substrate equivalent directions.

E547 - PROPERTIES OF ELECTROMAGNETIC WAVES IN CARBON NANOTUBES

Victor Dmitriev (UFPA) and Paulo Cleber M. Teixeira (UFPA)

Basing on the electromagnetic wave theory for carbon nanotubes published in literature, we analyze numerically the conditions of the eigenwave propagation in these nanotubes. Their dynamic conductivity is used to model the boundary conditions on the surface of zigzag, armchair and chiral of the tubes. We analyze the dispersion characteristics and the structure of the eigenwaves and dependence of their parameters on the dimensions of the carbon nanotubes and on the symmetry. Symmetry properties of these structures are investigated using the theory of line groups.

E550 - INFLUENCE OF BENTONITE CLAY PURIFICATION ON ITS ORGANOPHILIZATION

Paolo Eduardo Araújo (UFCEG), Claudia Maria Oliveira Raposo (UFCEG), Laura Hecker Carvalho (UFCEG) and Suedina Maria Lima Silva (UFCEG)

Bentonites are used for polymer nanocomposite production due to their high cation exchange capacity and expansion in solvents. Organophilization and clay expansion are key factors for these applications. Clay contamination hinders their ability to cation exchange, organophilize and expand. The influence of clay purification by organic matter and free iron removal on bentonite organophilization with a quaternary ammonium salt was investigated. Pristine and modified clays were characterized by FTIR and XRD. Organophilization was successful and clay purification led to higher interlayer distances.

E552 - SELECTIVE LASER SINTERING OF PA/HAP E HDPE/HAP COMPOSITES WITH FUNCTIONALLY GRADED COMPOSITION TO TISSUE ENGINEERING APPLICATIONS

Gean Vitor Salmoria (UFSC), Carlos Henrique Ahrens (UFSC), Frederic Dabbas (UFSC), Alexandre Lago (UFSC), Priscila Klauss (UFSC) and Rafael Garlet Oliveira (UFSC)

In rapid manufacturing field, the Selective Laser Sintering technique creates objects, layer by layer, from heat-fusible powder materials, allowing the sintering of composites. Functionally graded parts of PA, PE and hydroxyapatite

composites with application in scaffolds to tissue engineering were prepared by SLS. This work evaluates the microstructure and the dynamic mechanical properties of PA 2200 and HDPE used as matrix and hydroxyapatite (HAP) as filler. For tissue engineering applications, the HDPE/HAP composites show better mechanical properties and interesting microstructure presenting high porosity, large porous size and interconnectivity.

E553 - FACTORIAL DESIGN OPTIMIZATION OF UV PHOTOCHROMIC HYBRID XEROGELS FILMS CONTAINING HETEROPOLYOXOMETALATE AND AMINOSILANE

Adriano Lopes de Souza (USP), Roberto Luiz Andrade Haiduke (USP), Lino Misoguti (USP), Sérgio Carlos Zilio (USP), José Fabian Schneider (USP), Ubirajara Pereira Rodrigues-Filho (USP) and Máximo Siu Li (USP)

UV reversible photochromic xerogels globular layers were obtained based on phosphotungstic acid (HPW) and silane (s). The photochromic hybrid xerogels films were produced varying the compositions (in weight %) of the components: phosphotungstic acid (HPW), 3-aminopropyltriethoxysilane (APTS) and tetraethylorthosilicate (TEOS). Chemometry helped to understand the role of each component in the formulation of the xerogel for the photochromic response showing an interesting and complex interrelationship among the HPW and silanes concentrations.

E554 - SYNTHESIS OF PRECURSOR MATERIALS OF PROTON CONDUCTING POLYMERS

Thiago Ferreira Conceição (UFSC), José Roberto Bertolino (UFSC) and Alfredo Tibúrcio Nunes Pires (UFSC)

The aim of this study was to synthesize a new polymer that acts as a precursor for a series of proton conducting materials, where the proton conduction takes place through functional groups like -OH and -COOH. Polyetheretherketone was modified by insertion of NO₂ and NH₂ groups, to produce proton conducting materials as the polymer reactant. The modified polymer was characterized by infrared spectroscopy, thermogravimetric analysis and differential scanning calorimetric, showing that these polymers were successfully synthesized and that they are thermally stable up to 400 oC.

E555 - POLYMERIC FILMS OF P2VP AND PVP OBTAINED IN DIFFERENT ACIDS

Alfredo Tiburcio Nunes Pires (UFSC), José Roberto Bertolino (UFSC), Juan Carlos Alvarez Rodriguez (UFSC) and Aline Cristiane Ouros (UFSC)

The study of the properties of polymeric films formed in acid media, through the interaction of the proton with donor atoms has been gaining interest due to their potential use in fuel cell membranes. In this study the interactions of poly(2-vinylpyridine) [P2VP] and PVP with HCl, H₂SO₃, H₃PO₄ or HNO₃ was investigated through evaluation of the vibrational spectra. Films of P2VP and PVP were prepared in acid media and the interaction between polymer and acid was evaluated by FTIR through the observation of the characteristic band displacements and new bands related to the functional groups.

E556 - INFLUENCE OF SODIUM SACCHARIN AND CO ON THE ELECTRODEPOSITS OF FE ON SI(111) MORPHOLOGY

Juliana Zarpellon (UFPR), Dante H. Mosca (UFPR), Hugo F. Jurca

(UFPR), João J. Klein (UFPR) and Wido H. Schreiner (UFPR)

The electrodeposition of Fe on Si substrates from aqueous sulfated solution occurs at room temperature with spontaneous reaction and formation of Fe silicides Fe(Si_{1-x}Fex) with x=0,33 and x= 0,25, under potentiostatic conditions. In this work we investigate the influence of sodium saccharin and Co additives in the potentiostatic and galvanostatic electrodeposition of Fe onto hydrogen-terminated n-type (111) Si surfaces.

E557 - MECHANICAL BEHAVIOR OF CELLULOSIC BRAIDED FABRICS/RECYCLED POLYPROPYLENE ECO-COMPOSITES

Nubia Suely Santos (UEPA) and Carmen Tavares Dias (UFPA)

In this study the mechanical behavior of reinforced eco-composites using braided fabrics of cellulose fibers and recycled polypropylene matrix was investigated. Braided fabrics of cellulose fibers are commonly manufactured by Amazonian river populations, which extracted the fiber from Amazonian forest biodiversity. Guarumã/PP, miriti/PP and tucumã/PP composites were prepared and fractured on tensile tests. The experimental results demonstrated increase in elastic modulus comparing with PP matrix. The micromechanical model was performed with the purpose of analyze the influence of fiber volume fraction on the composites, resulting in accordance with the micromechanical theory.

E559 - GRAFTING OF HYDROXYAPATITE WITH POLI(ACID LACTIC)

Douglas Gouvêa, Rodinei Massamiti Abe, walker Soares Drumond, Romeu Casarano and Wang Shu Hui

Hydroxyapatite (HA) was grafted by L,L-lactide (LLA), produced in situ by solvent free ring-opening oligomerization in the presence of stannous octoate (SnOct₂), as catalyst. The reaction products were characterized by Fourier-transform infrared spectroscopy (FTIR), hydrogen nuclear magnetic resonance (1H NMR), scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDX) and dynamic mechanical thermal analysis (DMTA).

E560 - SBA-15 MESOPOROUS SILICA AND SULFATED ZIRCONIA SOL-GEL COMPOSITE FILMS: CHARACTERIZATION DURING DIP COATING

Alexandre Fassini Michels (UFRGS), Celso Valentim Santilli (UNESP), Silvana Leite de Albuquerque Maranhão (USP), Marcia Carvalho de Abreu Fantini (USP) and Flavio Horowitz (UFRGS)

Mesoporous silica and sulfated zirconia sol-gel composite films are subjected to double-optical monitoring during batch dip coating to study temporal film formation with varying nanostructure. Significant sensitivity to temporal film evolution of the resulting physical thickness and refractive index curves (uncertainties of ±7 nm and ±0.05, respectively) is shown under different withdrawal speeds. As a first contribution, detailed analysis is directed to the mass-drainage dominated stage, whose simple modeling with temporal t^{-1/2} dependence is verified experimentally.

E561 - INFLUENCE OF THE CURE PROCESS IN THE MECHANICAL PROPERTIES OF EPOXY/SWNTS NANOCOMPOSITES

Marcio Rodrigo Loos (UDESC), Carlos Pérez Bergmann (UFRGS), Márcio Dias Lima (UFRGS), Sandro Campos Amico (UFRGS), Jonas Bertholdi (UDESC), Sérgio Henrique Pezzin (UDESC) and Luiz Antônio Ferreira Coelho (UDESC)

The use of carbon nanotubes (CNTs) as reinforcement in polymer-based nanocomposites have been made since it's discovery¹, due to their unique structure and extraordinary mechanical, electrical and thermal properties²⁻³. The axial Young's modulus of CNTs is in the order of 1-5 TPa. The incorporation of small amounts of CNTs in polymers, usually between 0.1 and 5 wt.%, can potentially provide structural materials with exceptional increases in modulus and strenght⁴. The critical changes depend on the dispersion of the nanotubes and CNTs/matrix interface. Recent works have been focusing extensivel

E563 - EXPLORING THE LAYERED HEXANIOPATE EXFOLIATION IN TETRALCYLAMMONIUM HYDROXIDE SOLUTIONS

Ana Lucia Shiguihara (IQ - USP), Marcos Augusto Bizeto (IQ - USP) and Vera Regina Leopoldo Constantino (IQ - USP)

Layered compounds are an important class of materials due to the capacity of incorporating a great diversity of organic/inorganic guest species in interlayer region. The host-guest interaction produces materials with new chemical, physical, optical and mechanical properties, which are applied as heterogeneous catalysts, sensors, optical devices and molecular sieves. The intercalation of large species in layered compounds with high charge density, such as layered niobates, is very difficult.

E564 - POLYSULFONE NANOCOMPOSITE MEMBRANES FOR WATER TREATMENT

Priscila Anadão (Universidade de São Paulo), Francisco Rolando Valenzuela-Díaz (Universidade de São Paulo), Hélio Wiebeck (Universidade de São Paulo), José Carlos Mierzwa (Universidade de São Paulo) and Ivanildo Hespagnol (Universidade de São Paulo)

Asymmetric polysulfone (PSf) nanocomposite microfiltration (MF) membranes were fabricated using N-methyl-2-pyrrolidone (NMP) as a solvent as well as water as non-solvent. These membranes were spun by wet phase inversion from PSf/ sodium bentonite/NMP solutions. Effects of adding clay were investigated. Nanocomposite MF membranes were characterized by scanning electron microscope and contact angle measurements. By adding clay, it was observed a reduction in pore size. Furthermore, it was found that nanocomposite membranes exhibit higher hydrophilicity than polysulfone membranes.

E565 - PREPARATION AND CHARACTERIZATION OF RESORBABLE OSTEOMIMETIC MEMBRANE OF PLLA/ PEG AND HYDROXYAPATITE

Walter Israel Rojas-Cabreraa (USP), Walker Drumond Soares (USP), Shu Hui Wang (USP), Suely Miyagi (USP), Marcia Martins Marques (USP) and Dalva Cruz Laganá (USP)

We hypothesize that a composite membrane composed by a resorbable polymer, a hydrophilic polymer and an osteoconductive ceramic would be

the ideal biomaterial for mimicking the physicochemical and biological activities of the bone matrix and the bone cell growth. The biocompatibility was determined in vitro, by culturing fibroblasts on the membrane (PLLA/ PEG/HA) and the cells growth. The SEM pictures show an optimal and homogeneous porosity of the membrane, with pores diameter of 8.5 um, essential for nutrient supply and surface cell adaptation. SEM analysis allowed the observation of the adhe

E566 - MORPHOLOGY AND ELECTRICAL PROPERTIES OF DEPDM RUBBER AND PANI BLENDS

Daniela Assis Alvares (EPUSP), Jose Carlos Moreira (UNIFEI), Carlos Henrique Scuracchio (FAENQUIL) and Roberto Koji Onmori (EPUSP)

Blends with polyanilines are largely studied due to their easy processability, solubility, stability and doping. In this work, blends of polyaniline (PANI) doped with dodecylbenzenesulfonic acid (PADB) and ethylene-propylene-diene-monomer (EPDM) rubber devulcanized by microwave (dEPDM) were prepared by mechanical process. Flexible and stretchable films were obtained. As expected, the blend conductivity gets higher with increasing contents of conducting polymer. Also, the blends morphology presented a good physical interaction between matrix and dispersion phases for all compositions.

E568 - PREPARATION AND CHARACTERIZATION OF ORMOSIL COMPOSITES THIN FILMS

Gabriel Tacchi Nascimento (UFMG) and Nelcy Della Santina Mohallem (UFMG)

Hybrids thin film solution was prepared using tetraethoxysilane, ethanol, water and hydrochloric acid and was trimethoxysilylpropylmethacrylate (TMSPM) or metacrylic acid (MA). During the dipping process, thin liquid films stick on the two faces of the substrate. The influence of various parameters such as concentration, pH, surface tension, viscosity, withdrawal speed and temperature of densification on the thickness, porosity and morphology of the films is described.

E569 - ELECTROCHEMICAL AND MORPHOLOGIC STUDIES OF NICKEL INCORPORATION ON GRAPHITE ELECTRODES MODIFIED WITH POLYTYRAMINE

Cláudio Márcio Castro (Univ. Federal Uberlândia), Rafael Ariza Gonçalves (Univ. Federal Uberlândia), Ana Graci Brito-Madurro (Univ. Federal Uberlândia) and João Marcos Madurro (Univ. Federal Uberlândia)

This work reports the formation and surface analysis of modified electrodes through of electropolymerization of tyramine on graphite electrodes. Nickel was incorporated in the polymeric matrix and it was studied the hydrogen generation in solution of HCl.

E570 - OPTICAL CHARACTERISTICS OF SOL-SEL SILICA ADDITIVED WITH FORMAMIDE AND DOPED WITH COBALT

Nelício Faria de Sales (UFMG), Vilma Conceição Costa (UFMG), Herman Sander Mansur (UFMG) and Wander Luiz Vasconcelos (UFMG)

In this work we have evaluated the influence of concentration of precursors and temperature of process on structural properties of sol-gel silica

additived with low concentrations of formamide and doped with cobalt. The temperature influence on the VIS-NIR transmission was observed on the sample doped with cobalt. Samples were heated at 90 oC and at 120 oC and presented molar ratios of TEOS/formamide of 1/0.004, 1/0.013, 1/0.038 and 1/0.064. The molar ratio of TEOS/H2O/EtOH/HNO3 used for the four samples was 1/3.8/3.8/0.01. The first sample (TEOS/Formamide=1/0.004), was doped with cobalt.

E571 - BIODEGRADATION OF BLENDS OF POLY(A-CAPROLACTONE) WITH CELLULOSE ACETATE

Maria Regina Calil (USF), Flávia Gaboardi (USF), Cristina das Graças Fassina Guedes (USF) and Derval dos Santos Rosa (USF)

The biodegradation of poly(e-caprolactone) (PCL), cellulose acetate (CA) and their blends was assessed in maritime sediment and compared to biodegradation in soil compostage. The results showed that biodegradation in maritime sediment was much slower than in soil compostage. There was no significant variation on the biodegradation among samples submitted in maritime sediment. The samples aging in simulated soil, showed significant biodegradation, mainly for formulation containing higher amount of PCL, such the 80/20 (PCL/CA) which biodegraded totally after 270 days.

E572 - RAMAN SCATTERING STUDIES OF CeO2 NANOCRYSTALS DISPERSED INTO POROUS VYCOR GLASS

Bartolomeu Cruz Viana Neto (UFCE), Italo Odone Mazali (UNICAMP), Antonio Gomes Souza Filho (UFCE), Oswaldo Luis Alves (UNICAMP) and Josué Mendes Filho (UFCE)

In this work we report the characterization of CeO2 nanocrystals dispersed into a porous Vycor glass (PVG). The nanocrystal size was controlled via mass increment only and the matrix plays an important role in controlling of the nanocrystals size because it avoids the coalescence process. The coalescence control is attributed to nanocrystals dispersion into the host and to the terminal bonds present in the porous which act as an anchor thus resulting in a low diffusion into PVG. The nanocrystal diameter was evaluated by transmission electron microscope, x-ray diffraction and Raman scattering.

E573 - STUDY OF PHOSPHOLIPID/CHOLESTEROL HYBRIDS CHARACTERIZED THROUGH LANGMUIR ISOTHERMS

Juliano Elvis Oliveira (Federal University of Min) and Herman Sander Mansur (Federal University of Min)

The objective of this study was to investigate binary systems obtained by LB deposition method of phospholipids and cholesterol. Also, the influence of deposition parameters on the film packing was evaluated for monolayers. Phosphatidylcholines (DMPC, DPPC and DAPC) monolayers and their hybrids with cholesterol were characterized. The results clearly showed that as the length of alkyl chain for the phosphatidylcholines increased, the average area/molecule obtained by surface pressure isotherms has increased.

E574 - CHARACTERIZATION OF THE MECHANICAL AND THERMAL PROPERTIES OF POLY(EPILON-CAPROLACTONE) AND CELLULOSE ACETATE BLENDS

Marcelo Augusto Gonçalves Bardi (USF) and Derval Santos Rosa (USF)

As part of an investigation into producing biodegradable polymers, we evaluated the mechanical and thermal properties of PCL/CA blends and the effect of compatibilizer PE-g-GMA on these mixtures, developed by casting method. PE-g-GMA did not significantly affect the melting temperature but increased the tensile strength of pure PCL and the 40/60 blend, while reducing that of CA, indicating that the incorporation of a compatibilizer did not affect the miscibility of the system but affected the molecular orientation of its chains, as shown by the values obtained for the mechanical properties.

E575 - PREPARATION AND CHARACTERIZATION OF CONDUCTIVE POLYANILINE/THERMOPLASTIC POLYURETHANE BLENDS BY AN "IN SITU" EMULSION POLYMERIZATION

Denice Shulz Vicentini (UFSC), Guilherme Mariz de Oliveira Barra (UFSC), Alfredo Tibúrcio Nunes Pires (UFSC) and José Riberto Bertolino (UFSC)

Conducting blends of polyurethane thermoplastic elastomer (TPU) with different content of polyaniline doped with dodecyl benzenesulfonic acid (PAni.DBSA) were prepared by polymerization of anilinium salt in the presence of TPU. The flexible and homogeneous free-standing films obtained by "in situ" technique displayed low percolation threshold. TPU/PAni.DBSA blends display electrical conductivity values around 3.0×10^{-4} S/cm at 20 wt.% of PAni.DBSA content. The formation of conducting pathway was observed by optical microscopy that contributes for a higher conductivity values.

E576 - NATURAL SHORT FIBERS COMPOSITES MATERIALS

Richard Rachadel Martins (UFSC), Erik C. de Oliveira (UFSC), Márcio Celso Fredel (UFSC), Guilherme Mariz de Oliveira Barra (UFSC) and Hazim Ali Al-Qureshi (UFSC)

A short natural fiber obtained from mineral resources, which consists mainly of pure amorphous SiO2, was chemically modified with aminosilane in order to improve its interfacial adhesion in epoxy composites. The effect of the treatment of the fibers on the mechanical properties of the composite were evaluated and compared with properties obtained with natural fiber without superficial treatment. The results obtained show that these natural fibers are potential candidates as a reinforcement phase in polymer composites.

E577 - LAYERED DOUBLE HYDROXIDE INTERCALATED BY THE NON-STEROIDAL ANTI-INFLAMMATORY DRUG MEFENAMIC ACID

Vera Regina Leopoldo Constantino (USP-IQ) and Vanessa Roberta Rodrigues Cunha (USP-IQ)

Hydroxycalcite is a layered double hydroxides (LDHs) with the chemical composition $[Mg_6Al_2(OH)_{16}]CO_3 \cdot xH_2O$; that consists of positively charged layers and it is known to be effective antacids. LDHs are biocompatible anionic exchanger materials, which make them interesting hosts to be explored as drug carriers. Recent works have reported the intercalation of biochemical species such as amino acids DNA, anti-inflammatory and anti-cancer drugs into the interlayer spaces of LDHs.

E579 - THE INFLUENCE OF A PRO-OXIDANT ADDITIVE ON MECHANICAL PROPERTIES AND MFI OF LDPE

Lincoln Silva Gomes (Universidade São Francisco), Diego Molina (Universidade São Francisco), Cristina Fassina Guedes and Derval Santos Rosa (Universidade São Francisco)

The effect of calcium stearate on mechanical properties and melt flow index (MFI) of low density polyethylene (LDPE) was investigated through of chemical mechanism of pro-oxidant action. It was monitored by measuring the changes in tensile strength, elongation at break and melt flow index. The results indicate that the addition of a pro-oxidant additive did not alter the mechanical properties and MFI of LDPE.

E580 - WEIBULL DISTRIBUTION ANALYSIS APPLIED TO PHENOLIC RESIN

Carolina Cesconetto Silveira (UFSC), Márcio Celso Fredel (UFSC), Eduardo Rovaris Gomes (Fras-le), Alexandre Casaril (Fras-le), Marcos Roberto Soares (Fras-le) and Hazim Ali Al-Qureshi (UFSC)

Flexural strength of phenolic resin was evaluated by using four-point test bending method. The results showed wide flexural strength scatter. Weibull distribution was then applied and showed a bimodal distribution. Fractography analysis showed that the differences found in the examination could have been caused by the different flaw populations.

E581 - PREPARATION OF PTRU/CARBON HYBRID STRUCTURES BY HYDROTHERMAL CARBONIZATION FOR METHANOL ELECTRO-OXIDATION

Marcelo Marques Tusi (IPEN/CNEN-SP), Olandir Vercino Correa (IPEN/CNEN-SP), Almir Oliveira Neto (IPEN/CNEN-SP), Marcelo Linardi (IPEN/CNEN-SP) and Estevam Vitorio Spinacé (IPEN/CNEN-SP)

Fuel Cells employing alcohols directly as fuel (Direct Alcohol Fuel Cell) are extremely attractive as power sources for mobile and portable applications. Methanol has been considered the most promising alcohol and carbon-supported PtRu nanoparticles the best electrocatalyst. In this work, we prepare PtRu/Carbon hybrid structures by hydrothermal carbonization using glucose as carbon source and reducing agent, and H₂PtCl₆.6H₂O and RuCl₃.xH₂O as metal sources. The PtRu/Carbon materials were characterized by EDX, XRD, SEM, TGA and CV and tested for methanol electrooxidation.

E584 - HYBRID ORGANIC-INORGANIC MATERIALS BASED ON POLYPYRROLE AND DIANIONS DERIVED FROM 1,3-DITHIOLE-2-THIONE-4,5-DITHIOLATE - DMIT

Antonio Gerson Bernardo da Cruz (IQ/UFRJ), James Lewis Wardell (IQ/UFRJ) and Ana Maria Rocco (IQ/UFRJ)

The electrosynthesis of hybrid materials based on pyrrole and [NEt₄]²⁺[M(dmit)^{x-}] (dmit = 1,3-dithiole-2-thione-4,5-dithiolate and M = Ni, Pd, Pt and Sn) is reported. The materials are electroactive undergoing redox processes. They showed good thermal stability, conductivity and high specific capacitance, with possible application as electrode materials in electrochemical supercapacitors.

E585 - SMALL ANGLE X-RAY SCATTERING (SAXS) AND FTIR STUDIES ON POLYPYRROLE/ZEOLITE Y NANOCOMPOSITES

Ronaldo Custodio Oliveira (IQ/UFRJ), Robson Pacheco Pereira (NiT/RJ), Antonio Gerson Bernardo da Cruz (IQ/UFRJ), Maria Iaponeide Macedo (IQ/UFRJ), Claudio Jose de Araujo Mota (IQ/UFRJ) and Ana Maria Rocco (IQ/UFRJ)

In the present work, polypyrrole/Zeolite Y nanocomposites were synthesized and characterized by small angle X-ray scattering (SAXS) and vibrational spectroscopy (FTIR). The structure dependence on the initial pyrrole concentration and reaction time is evident by both techniques employed, where confined and adsorbed (oligo- and poly-) pyrrole are identified.

E586 - THERMAL PROPERTIES OF MULTI-WALLED CARBON NANOTUBE AND POLY(HYDROXYBUTYRATE-CO-HYDROXYVALERATE) COMPOSITE

Ana Paula Lemes (Unicamp) and Nelson Durán (Unicamp)

Composite based on poly(hydroxybutyrate-co-hydroxyvalerate) (PHBV) and multi walled carbon nanotubes (MWCNT) was prepared by solvent casting. The thermal behavior and stability of composite was investigated by differential scanning calorimetric (DSC) and termogravimetric analysis (TGA). DSC indicated that endothermic peaks of composite were narrower and more symmetrical than pure PHBV, suggesting that MWNTC acts as a nucleating agent. TGA showed that weight loss in the composite occurred in higher temperature than pure PHBV, indicating a increase in the thermal stability of PHBV matrix.

E587 - INFLUENCE OF TEMPLATE SYNTHESIS CONDITIONS ON THE ELECTROCHEMICAL BEHAVIOR OF THE P(3-MET)/PVDF COMPOSITE

Silmara Neves (Universidade São Francisco), João Eduardo Benedetti (Universidade São Francisco), Sheila Criistina Canobre (Universidade São Francisco) and Carla Polo Fonseca (Universidade São Francisco)

Composite electrodes were prepared via electrochemical polymerization of 3-methylthiophene in porous PVDF membranes of various thicknesses. It was observed in the voltammogram of P(3-MeT)/PVDF composite a better definition of anodic and cathodic peaks, especially with a n-type doping, using a host matrix of 27.5 and 15.5 mm in thickness. It is fair to note by SEM that the thicker matrix presented a more compact morphology in relation to the thinner; therefore, forcing a greater spatial restriction to the growth of the conducting polymer. Consequently, greater values of specific capacitance, in

POSTER SESSION PE2 - TUESDAY, OCTOBER 10

E582 - MAGNETIC PROPERTIES OF CO NANOCLUSTERS ELECTRODEPOSITED ON ALUMINA

H. F. Jurca (UFPR), D. H. Mosca (UFPR), N. Mattoso (UFPR), J. J. Klein (UFPR) and W. H. Schreiner (UFPR)

Magnetic properties of nanoaggregates are widely studied due to their potential applications for the high-density magnetic recording industry. Recent works have been demonstrated the feasibility of the growth of magnetic nanodots on anodized alumina surface with self-assembled nanocavities [1-4]. In this work, we have investigated the nucleation of Co nanoclusters onto anodized alumina surface.

the order of 80 Fg-1, have been observed in these cases.

E588 - PURIFICATION OF CATALYTICALLY PRODUCED CARBON NANOTUBES FOR USE AS SUPPORT FOR FUEL CELL CATHODE CATALYST

Cristiane Abrantes da Silva (IQ/UFRJ), Maria Fernandes Macedo (IQ/UFRJ), Luis Fernando Maestro (IFGW/UNICAMP), Marcelo Hawrilak Herbst (UEZO), Guillermo Solórzano (PUC-Rio) and Ana Maria Rocco (IQ/UFRJ)

Temperature programmed oxidation (TPO) and Raman spectroscopy were used as quantitative and qualitative analysis techniques of raw and purified CNT samples. For a series of CNT samples it was possible to evaluate the effectiveness of the techniques for quantitative determination of impurities in the samples as well as information about the CNT synthesized. Samples were also analyzed by SEM and TEM in order to characterize the morphology obtained.

E589 - ELECTRODEPOSITION OF SUPERMALLOY

Paulo Bernardo de Camargo Gaiotto (UFPR), Ney Mattoso (UFPR), João Jorge Klein (UFPR), Wido Herwig Schreiner (UFPR) and Dante Homero Mosca (UFPR)

In this work it was studied the deposition of alloy Ni79Fe16Mo5 (supermalloy) on copper plates and evaporated film of copper on glass substrates by electrodeposition technique, from voltametric curves and diffractograms of XRD and analysis by XPS, were characterized the deposits of pure nickel, permalloy and supermalloy.

E590 - NANOSTRUCTURED ELECTROCHEMICAL DEVICE BASED ON THE POROUS LIMN2O4 FILMS OBTAINED BY TEMPLATE SYNTHESIS

Fabio Augusto Amaral (USF), Mariane Bellei (USF), Silmara Neves (USF) and Carla Polo Fonseca (USF)

Cellulose acetate was used as template for the LiMn2O4 nanoparticles synthesis. XRD, DSC and SEM were used for characterization of the oxides. The P(EPI-co-EO)/PCL blend was used as SPE in lithium polymer battery. Electrochemical experiments of this new device showed a charge/discharge capacity higher than conventional lithium battery. Specific charge capacity of the Li/ P(EPI-co-EO)/PCL+ LiClO4/LiMn2O4 system was approximately 110 mAhg-1.

E591 - STRUCTURED MCM-41 AND HMS SILICAS FUNCTIONALIZED WITH TETRASULFIDE GROUPS OBTAINED FROM ONE-POT SYNTHESIS

José Almir de Almeida Sales (UFAL) and Claudio Airoldi (UNICAMP)

MCM-41 and HMS functionalized silicas with bis-tetrasulfide were firstly synthesized via co-condensation of tetraethylorthosilicate and bis-[3-(triethoxysilyl)propyl]tetrasulfide by using both surfactant ionic cetyltrimethylammonium bromide and dodecylamine as the structure directing agent, to the structured materials. Based on carbon elemental analysis, the contents of tetrasulfide groups in the MCM-S4 is lower than in HMS-S4.

E593 - THEORETICAL-EXPERIMENTAL ELECTRIC STUDY OF CHARGE TRANSPORT MECHANISMS FOR A HYBRID COMPOSITE BASED ON POMA/P(VDF-TRFE)/Zn2SiO4:Mn USING IMPEDANCE SPECTROSCOPY

Giovani Gozzi (IFSC-USP), Dante Luis Chinaglia (IGCE-UNESP), Thais Fernandes Schmidt (IFSC-USP), Lygia Cristina Walmsley (IGCE-UNESP), Carlos José Constantino (FCT-UNESP), Aldo Eloizo Job (FCT-UNESP), Lucas Figikawa Santos (IFSC-USP) and Osvaldo Novais Júnior (IFSC-USP)

We propose a theoretical model based on Lepienski et al and RFEB model to explain the behavior of complex conductivities vs. frequency from impedance spectroscopy measurements. DSC measurements were also made with the objective to prove the occurrence of morphological changes identified through the theoretical approximation of the experimental results.

E594 - EFFECT OF PEGAA CONCENTRATION ON THE RHEOLOGICAL PROPERTIES OF PA6/PEGAA/LDPE BLEND

Pankaj Agrawal (UFCG), Edcleide Maria Araújo (UFCG) and Tomás Jeferson A. Melo (UFCG)

In this work, the effect of PEGAA concentration on the rheological properties of PA6/PEGAA/LDPE blend was investigated. Torque rheometry analysis showed that increasing the PEGAA the torque of the blends also increases. However, the greater the PEGAA concentration, the greater is the blend degradation.

E595 - THE EFFECT OF ORGANIC MODIFIER OF THE CLAY ON MORPHOLOGY AND CRYSTALLIZATION BEHAVIOR OF PET NANOCOMPOSITES

Carmen Iara Walter Calcagno (PGCIMAT/UFRRGS - CEFET/RS), Cleide Mary Mariani (IQ/UFRRGS), Sérgio Ribeiro Teixeira (IF/UFRRGS) and Raquel Santos Mauler (PGCIMAT/UFRRGS)

PET nanocomposites were prepared using montmorillonite with different organic modifiers. Intercalated and exfoliated morphology were obtained, and an average maximum distance between the platelets was observed in the intercalated morphology. The influence of the organic modifiers in the intercalation and exfoliation processes was evaluated by TEM, WAXD, POM and DSC. The clay nucleated the PET crystallization process. Tactoids were obtained when only apolar modifiers were present. It was observed that PET nanocomposites were intercalated and exfoliated when polar modifiers were present.

E596 - IN SITU CHARACTERIZATION OF THE PHASE TRANSITION BCC-FCC IN COXFE100-X ALLOYS ELECTRODEPOSITED

Alex Boiarski Cezar (UFPR) and Ney Mattoso (UFPR)

Metals in the group of iron combine with binary alloys in this work have important industrial applications, such as microelectronic system. This work has a main goal, the in situ characterization of phase transition CoFe100-x electrodeposited. The investigation of the phase transition BCC-FCC is done in situ with development of a sample holder for electric measures in vacuum during thermal treatment.

E597 - BEHAVIOR OF BENDING TEST OF COMPOSITES MATERIALS OF EPOXY MATRIX REINFORCED BY NATURALS FIBERS

Jean da Silva Rodrigues (UFPA) and Roberto Tetsuo Fujiyama (UFPA)

This work show the behavior of bending test of composites materials of epoxy matrix reinforced by naturals fibers. The fiber used were sisal and hybrid juta/malva. The sisal used was short fibers (25 mm) and the juta/malva was roving. The bending test was in three points.

E598 - POLYPROPYLENE/COCONUT COIR FIBER COMPOSITES: INTERFACIAL MODIFICATION AND CHARACTERIZATION

Evelise Fonseca Santos (UFRGS) and Sônia Marli Bohrz Nachtigall (UFRGS)

Coir fibers are natural materials that can offer economical and environmental advantages over traditional inorganic reinforcements and fillers for polymer composites. In this study, polypropylene grafted with maleic anhydride and vinyltriethoxysilane were employed as coupling agents for polypropylene/coconut coir fiber composites. It was verified that low concentration of the coupling agents (~0.5 wt%) showed improvements in the tensile properties of the materials. Water swelling experiments and scanning electron microscopy analysis were also performed.

E599 - EFFECT OF THERMAL-AGING IN THE PROPERTIES OF NANOCOMPOSITES

Creusa Iara Ferreira (UFRGS), Luciana Portal da Silva (Braskem), Susana Alcira Liberman (Braskem) and Raquel Santos Mauler (UFRGS)

The study of the degradation and stabilization of polymers is extremely important for scientific and industrial applications, therefore, better understanding of the degradation of polymers can assure the long life of the product. In this work, thermal aging evaluation was applied to the nanocomposites due to the addition of organophilic clays and compatibilizers agents with the action of the time and temperature. The mechanical properties of the nanocomposites demonstrated that, as well as polypropylene, they have stability with the time.

E601 - POLYPROPYLENE NANOCOMPOSITE: THE INFLUENCE OF THE COMPATIBILIZER AGENT

Kelly Silva Santos (UFRGS), Susana Alcira Liberman (Braskem) and Raquel Santos Mauler (UFRGS)

Polymer layered silicate nanocomposites are expected to have better properties due to the exfoliation/dispersion of the nanoclay layers within the polymer matrix. The aim of this work is to study the effect of the PPG-MA and PPG-VTES in the dispersion of silicate layers of organophilic montmorillonites modified with quaternary ammonium salt the Viscogel ED, the Cloisite 20A and Cloisite 15A). All the nanocomposites obtained presented an intercalated form, however the increase of compatibilizer favors the exfoliation of the clay platelets.

E602 - STRUCTURAL AND MAGNETIC PROPERTIES OF ELECTRODEPOSITED CO-DOPED CeO2 FILMS

Vilmar Fernandes (UFPR), João J Klein (UFPR), Wido H Schreiner

(UFPR), Ney Mattoso (UFPR), Dante H Mosca (UFPR), Edilson Silveira (UFPR) and Adilson J. A. Oliveira (UFSCar)

Co-doped cerium oxide films were grown by electrodeposition onto Si(001) substrates. According to the transmission electron microscopy analyses, samples deposited at room temperature are poorly crystalline with average crystalline grain size of a few tens of nanometers. Scanning electron microscopy with energy dispersive x-ray analyses reveal that deposits are homogeneous with a uniform distribution of cobalt in the cerium oxide matrix, where as X-ray photoelectron spectroscopy analyses suggest a non-metallic character of Co. Magnetic measurements performed by SQUID magnetometer for samples with Co concentration as low as ~ 2 at. % indicates a ferromagnetic signal at room temperature.

E603 - THE FORMATION OF HYBRID PHASE AT THE POLYMER MODIFIED MORTAR/PORCELAIN TILE INTERFACE

Alexandra Piscitelli Mansur (UFMG) and Herman Sander Mansur (UFMG)

The need of bonding development and improvement at the interface between low porosity ceramic tiles and polymer modified mortars has been extensively studied and the effectiveness of this linkage is crucial for the use of adhered method for installation of ceramic tiles. In this sense this paper present results of improvement in bonding between ceramic tile and mortar by the development of a hybrid polymeric-ceramic interface using poly(vinyl alcohol), PVA, polymer modified cement mortar. Mortar modification was found to improve the bonding between tiles and mortar changing the mode of rupture

E606 - SYNTHESIS OF SINGLE-WALLED CARBON NANOTUBES USING CVD TECHNIQUE

Gilberto Dantas Saraiva (UFC), Eduardo B Barros (UFC), Antônio Gomes de Souza Filho (UFC), Rafaela Oliveira Nascimento (UFC), Nágila Ricardo (UFC) and Josué Mendes Filho (UFC)

In this work we report the preparation of single walled carbon nanotubes (SWNTs) by chemical vapor deposition (CVD) using Fe particles as catalysts and methane as carbon source. The Fe catalysts were exposed to hydrogen gas (with different exposure times) before introducing methane.

E608 - CHARACTERIZATION OF THIN FILMS OF COXFE1-X ELECTRODEPOSITED DIRECTLY ON SUBSTRATES SEMICONDUCTORS SI(111) AND FORMATION OF SILICIDES

Itamar Tomio Neckel (UFPR), Alex Boiarsk Cezar (UFPR), João Jorge Klein (UFPR), Wido Herwig Schreiner (UFPR), Dante Homero Mosca (UFPR) and Ney Mattoso (UFPR)

Thin films of magnetic materials and composed of metal-silicon (silicides) have great technological applications that stimulates researchers to develop materials and technological progresses. The thin films were produced by potentiostatic electrodeposition. The study of the nucleation indicates instantaneous process. The thin films were analyzed by scanning microscopy electronic, x-ray diffraction and for photoemission spectroscopy (XPS). The results indicate thin films metallic and polycrystalline, presenting texture crystallographic preferential to the [110] direction.

E609 - GOLD NANOPARTICLES AND SWITCH TRIGGERED BY FE(II) IONS

Jonnatan Julival dos Santos (IQ-USP), Juliano Alves Bonacin (IQ-USP), Sergio Hiroshi Toma (IQ-USP), Aline M. C. Assumpção (IQ-USP), Henrique Eisi Toma (IQ-USP) and Koiti Araki (IQ-USP)

In this work we report on the modification of gold nanoparticles (AuNps) stabilizing layer with 4´-(3-thienyl)2-2´:6´, 2´´-terpyridine (3-tf-terpy). These new AuNps were able to self-aggregate in the presence of small amounts of iron(II) ions by their coordination with 3-tf-terpy.

E610 - MEASUREMENT OF THE PEAK TEMPERATURE IN PULSED LASER HEATING OF SAMPLES IN A SAPPHIRE ANVIL CELL

Marcos Luiz Andrezza (UCS-UFRGS), Claudio Antonio Perottoni (UCS-UFRGS) and João Alzira Hertz da Jornada (INMETRO)

Laser heating of small samples in high pressure devices has emerged as an important tool for the study of a large spectrum of physics properties of materials at high pressure and high temperature. The knowledge of the temperature and pressure at which a new compound is formed is of fundamental importance, even in the case the synthesis proceeds under non-equilibrium conditions. The purpose of this work is to describe an experimental assembly that have been used to measure the peak temperature in laser heating of samples under high pressure in a sapphire anvil cell.

E612 - PTRU: CARBON NANOTUBE/CARBON FELT COMPOSITE AS ELECTRODE FOR DIRECT METHANOL FUEL CELL

Jose Mauricio rosolen (USP), Ines R de Moraes (USP) and Elaine Y Matsubara (USP)

We proposed in this work a new support for catalytic particles based on a carbon nanotubes/carbon felt composite. It was shown that this new composite appears very interesting as support for incorporation of PtRu nanoparticles with average diameter of the 4nm. Different PtRu loadings were studied and the composite with 5% of PtRu was able to provide a good performance. For methanol oxidation it was found a small variation of current with polarization time of electrode at 0.5V.

E613 - CARBON NANOTUBE/CARBON FELT AS ELECTRODE FOR CAPACITOR

Jose Mauricio Rosolen (USP), Elaine Y Matsubara (USP), Erica C Almeida (INPE), Neidenei G Ferreira (INPE) and Marcel S Marchesin (USP)

This work proposes carbon nanotube/carbon felt composite as novel electrode for preparation of capacitors. The felt obtained from carbonization of a polymer felt allows mount higher amounts of CNTs grown by using CVD method. For a disk electrode with diameter about 7mm and with thickness about 1mm the CNT/felt double-layer capacitance Cd in H2SO4 is 0.22F.g-1 with a 3.7mg of CNT loading, while in non-aqueous electrolyte Cd is 40mF and 200mF with a CNT loading 2.11mg and 13.93mg, respectively. The Cd depends predominantly on CNT loading on the felt.

E616 - THERMAL AND MECHANICAL PROPERTIES OF PA12/POSS NANOCOMPOSITES

Gabriela Gobbi (UCS), Alan Pereira Kauling (UCS), Leonardo Bresciani Canto (IMA-UFRJ) and Ricardo V. B. Oliveira (UCS)

Due to the recent interest in hybrid organic-inorganic materials, such as polyhedral oligomeric silsesquioxanes [POSS], many preparation methods have been developed. The POSS molecules posses a cage-like structure and a hybrid chemical composition. The current work focuses on the preparation of polyamide-12 [PA12] mixtures with different POSS molecules and the effect on the thermal and mechanical properties of PA12/POSS nanocomposites. As conclusion, PA12 reinforcement by POSS incorporation was obtained despite the consequences of nucleation effect and a probable polymorphism of PA12.

E617 - STABILIZATION OF GOLD NANOPARTICULES BY DIAMINEDIMERCAPTOPYRIMIDINE

Ronaldo Adriano Timm (IQ / USP), Leonardo da Silva Bonifácio (IQ / USP) and Henrique Eisi Toma (IQ / USP)

DADMCP-coated gold nanoparticles have been prepared by the direct exposition of the citrate stabilized nanoparticles to 4,5-diamine-2,6-dimercapto-pyrimidine (DADMCP). The modification has been studied by UV-visible spectroscopy in aqueous solution as a function of pH, allowing the exploitation of the charge effects on the nanoparticles stabilization.

E618 - STUDY OF DISPERSION OF ALUMINA NANOTUBES IN POLYMERIC MATRICES

Juliana A. Sales (UFMG), Cristina F. Diniz (UFMG), Nelcy D.S. Mohallem (UFMG), Glaura G. Silva (UFMG) and Dario Windmöller (UFMG)

Composites membranes were prepared by dispersing alumina nanotubes (5-15 nm of diameter and 33-72 nm of length) in thermoplastic polyurethanes with the purpose for gas separation membranes. In this work, some parameters related with the nanotube dispersion on polymeric matrix were studied by scanning electron microscopy and microanalysis in order to evaluate the quality of the dispersions. The best results were obtained using DMF or NMP solvents. WDS elemental Al mapping showed that ultrasonic treatment alumina nanotubes were more well dispersed on polymeric matrix than by stirring method.

E619 - CHARACTERIZATION OF AN ARGENTINIAN BENTONITE TO USE IN ADSORPTION

Patrícia Lie Tobotui (UFSC), Glêdes Cabral de Albuquerque Viotti (UFSC) and Humberto Gracher Riella (UFSC)

In this work we have as objective to study an Argentinian bentonite clay to verify the smectite phase, evaluate the degree of swell as well as its adsorption in water. In such a way characterizations like diffraction of X-Rays and Foster´s Swelling were done.

E620 - VERTICALLY ALIGNED MULTIWALLED CARBON NANOTUBES (MWNT) BY DC PLASMA ENHANCED CHEMICAL VAPOR DEPOSITION (DC-PECVD)

Cristiano Saboia Camacho (PUC-Rio)

This work reports the growth of vertically aligned Multiwalled Carbon Nanotubes (MWNT) by dc plasma enhanced chemical vapor deposition (DC-PECVD). Nickel nanoparticles were used as catalyses. They were obtained by the thermal annealing of a thin Ni film deposited onto SiO₂/Si substrates by rf-sputtering. The thickness of these films (2nm) were carefully determined by RBS. Scanning electron microscopy (SEM) and Raman scattering techniques were used o the MWNT characterization. These MWNT will be used in a prototype of gas sensors.

E622 - MECHANICAL AND THERMAL PROPERTIES OF PS/POSS NANOCOMPOSITES

Alan Pereira Kauling (UCS), Gabriela Gobbi (UCS), Leonardo Bresciani Canto (IMA-UFRJ) and Ricardo V.B. Oliveira (UCS)

In the past decade, researchers' interest has been widely attracted by the possibility to prepare hybrids and nanocomposites starting from inorganic cage molecules constituted by a silicon-oxygen based framework. The properties of organic-inorganic hybrids nanocomposites depend on the uniform dispersion of filler in the polymeric matrix. Our goal in this work is to understand the effect of POSS molecules on both mechanical and thermal properties of polystyrene (PS) nanocomposites. The results indicate the nanoreinforcement effect of POSS cage in PS structure.

E623 - BIOACTIVITY STUDY OF NANOCOMPOSITES SBA-15/FE3O4 FOR POSSIBLE APPLICATION IN SYSTEMS OF CONTROLLED RELEASE

Karynne Cristina Souza (CDTN), Andreza Sousa (CDTN), Clarissa Drummond Moreira (CDTN) and Edésia Martins Barros Sousa (CDTN)

SBA-15 and magnetic nanocomposites embedded into mesoporous silica had been synthesized. The bioactivity were evaluated through the formation of a hydroxyapatite layer in the surface of material by soaking the samples in SBF. Calcium ionic concentration and changes in pH were measured after different times of soaking by using Ilyte system apparatus. XRD measurements suggests the formation of an apatite-like layer on the surface of sample. SEM micrographs show agglomerates of spherical with porous morphology that seem to be coated by a film after soaking in 7 days. FTIR spectra showed changes in the composition before and after soaking in SBF after 7 days.

E627 - INFLUENCE OF PRESSURE ON CELL PARAMETERS OF HOT-PRESSED PHB

Carlos Eduardo Pinto (PIPE-UFPR), Gregorio Arizaga Carbajal (UFPR), Kestur Gundappa Satyanarayana (UFPR) and Fernando Wypych (UFPR)

The samples of Polyhydroxybutyrate (PHB) were pressurized by hot-pressing at different loads (2, 4, 6, 8 and 10 tons). The internal cells of the polymer undergo deformation. This was evaluated through measurements of cell parameters based on X-ray diffraction studies. The distances along the lattice axis of the orthorhombic cell decrease with increasing pressure. This study has enabled to optimize the processing of PHB-natural fiber composites, which will have bearing on the processing-structure-properties correlations.

E628 - STUDY OF THE METAL-CNTS INTERACTION BY TUBE DECORATION UPON IN SITU PRODUCTION AND

REDUCTION OF METAL OXIDES

Dunieskys González Larrudé (PUC-Rio), Paola Ayala Hinojosa (PUC-Rio), Gino Mariotto (Università di Trieste) and Fernando Freire Junior (PUC-Rio)

Pure carbon tubes as well as nitrogen doped multi-walled nanotubes is synthesized by spray pyrolysis. A wet chemistry method has been considered in order to obtain nanostructured cobalt by decomposition of the cobalt nitrate hexahydrate. A latter reduction of the intermediate product is carried out in order to obtain metal decorated tubes. We detail specific examples of catalyst synthesis strategies for modifying interactions between the carbon nanotubes and the cobalt precursor, promoting reduction, and controlling the distribution of cobalt on the nanotube's walls.

E630 - SYNTHESIS OF NICKEL NANOPARTICLES EMBEDDED INTO MESOPOROUS SILICA-CARBON MATRIX FOR APPLICATION IN HETEROGENEOUS CATALYSIS

Alberto Adriano Cavaleiro (IBB-UNESP), Juliana Catarina Bruno (IBB-UNESP) and Arioaldo Oliveira Florentino (IBB-UNESP)

The preparation of nickel nanoparticles into silica-carbon matrix composites by using the polymeric precursor method was investigated in this work. The characteristics of the mesoporosity and the dispersion of nickel nanoparticle into non-aqueous amorphous silica-carbon matrix containing nanosized nickel particles have been investigated by adsorption/desorption isotherms and TEM.

E631 - COMPARATIVE STUDY OF THE G-BAND OF CARBON NANOTUBES IN BUNDLES AND DISPERSED IN AQUEOUS SOLUTION

Ana Paula Gomes (UFMG), Ado Jorio (UFMG), Marcos Assunção Pimenta (UFMG), Valdirene Peressinotto (CNEN) and Adelina Pinheiro Santos (CNEN)

We have used resonant Raman spectroscopy to study the effect of the environment on the tangential modes (also known as G-Band) of carbon nanotubes. The G-Band of the SWNTs in bundles was found to be composed by more peaks than the G-Band of the dispersed ones. Performing measurements on dry solutions, we eliminated the effect of population of nanotubes, since both their tangential and RBM spectra are more similar to that of the SWNTs bundles than that of the dispersed ones.

E540 - EFFECTS OF PREPARATION CONDITIONS ON MORPHOLOGY OF ANODIC TiO₂/Ti FILMS

Fabricao Heitor Martelli (UFSCar), Francisco Trivinho Strixino (UFSCar) and Ernesto Chaves Pereira (UFSCar)

It was investigated the effects of several preparation parameters, i.e., electrolyte concentration, anodization temperature and current density, on the surface morphology of TiO₂/Ti films. This was carried out using a chemometric approach with a 2³ factorial design. In this approach it was observed that changing the preparation parameters leads to important morphological and electrochemical modifications. For example, large porous formation was favorable for samples prepared in low current density and temperature.