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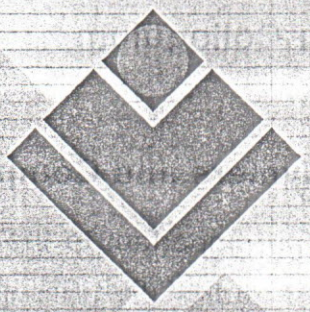

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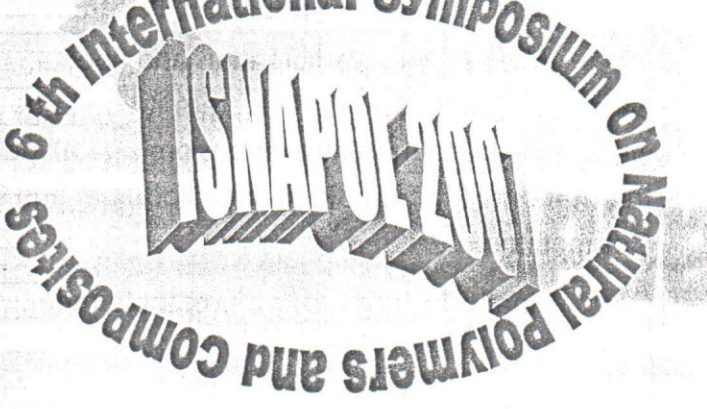

Program and Proceedings

analysis showed that when PEgAA and EMA-GMA were added to PA6/LDPE blend, there was an increase in the torque, indicating that reactive compatibilization has occurred. The increase in the torque was more pronounced for the PA6/PEgAA/LDPE blend. The results of mechanical properties indicated that there was a substantial increase in the Izod impact strength when PEgAA and EMA-GMA were added to PA6/LDPE blend. SEM analysis indicated that the addition of PEgAA and EMA-GMA to PA6/LDPE blend remarkably decreases the disperse phase particles average size and improves the adhesion between PA6 and LDPE phases.

Poster 091

CORRELATION BETWEEN THE GLASS TRANSITION TEMPERATURE AND PROCESSING OF PVDF/PMMA BLENDS

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Polymer blends of poly(vinylidene fluoride) (PVDF) with poly(methyl methacrylate) (PMMA) were prepared by melt mixing in proportions of 20 and 40 wt% of PVDF using two types of mixer, a Haake mixer and a Drais type mixer. The Kwei equation was used to evaluate the miscibility behavior of the blend and interaction parameters between the components of the blend, using differential scanning calorimetry to determine the experimental values of the glass transition. PVDF/PMMA blend system has a single glass transition temperature up to 50% wt% of PVDF, indicating that this blend form a miscible phase. Results showed that Drais mixer processing caused a decrease of Tg's of the materials studied and the Kwei equation fitted well experimental data, indicating that the processing did not influenced the molecular interactions between the blend components.

Poster 092

MISCIBILITY AND THERMAL PROPERTIES OF BLENDS OF POLY(3-HYDROXYBUTYRATE) AND POLYETHYLENE OXIDE

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Blends of poly(3-hydroxybutyrate) (PHB) and poly(ethylene oxide) (PEO), having molar masses of 4,000,000 or 300 g.mol^{-1} were prepared by solution casting. Blend were prepared in weight proportions of PHB:PEO of 95:5, 90:10, 80:20 and 70:30, respectively. Thermal analyses of the blends were performed by differential scanning calorimetry (DSC), thermogravimetric analysis (TGA) and dynamic-mechanical thermal analysis (DMTA). The samples were allowed to age under controlled conditions for three months and were analyzed and compared to those as prepared. The DSC curves are characterized by multiple melting peaks of PHB crystalline phase in the blend, while PEO crystalline melting was not observed, except in the 70:30 blend. TGA of the blends revealed two-step degradation profiles and the thermal stabilization decreased with increasing the amount of PEO in the blend. DMTA analysis revealed a broad mechanical relaxation, associated to the glass transition temperature from –50 to 50 °C, observed as a sharp decrease in the storage modulus E' and peaks in the loss modulus E" and tanδ.

Poster 093

USE OF RICE HUSK FOR THE PARTIAL SUBSTITUTION OF GLASS FIBERS IN AIR CONDITIONING PROTECTIVE COVERS

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The present study has evaluated the possibility of using rice husk to partially replace glass fiber in order to produce polyester resin composites and compare these composites with a commercial product (air conditionating protective cover). The composites were prepared with different glass fiber and rice husk weight content by compression molding. Flexural, impact and hardness mechanical tests were carried out in the composites. The composites with higher glass fiber content showed better mechanical proprieties. The partial substitution of fiber glass by rice husk has lead to composites with slightly higher flexural modulus, hardness and impact strength. Besides, it did not significantly compromised its flexural strength, indicating that this hybrid composite has the potential to be used as air conditioning protective cover.

Poster 094

DEVELOPMENT AND MECHANICAL CARACTERIZATION OF LDPE/UNIDIRECTIONAL JUTE YARN COMPOSITES

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Although natural fiber reinforced polymer composites have been studied and employed for many years, their mechanical properties are low because most processes demand that the fillers be short fibers or powders. Processes that allow the use of long and continuous natural fibers as reinforcement in thermoplastic matrices are needed if composites with higher properties are to be obtained. This work deals with the production and tensile properties of LDPE/unidirectional jute yarn composites. A commercial linear low density polyethylene (LLDPE) film was used as the matrix and jute yarns (classification 10/2) were used to prepare the composites. Jute yarn impregnated laminas were manufactured, stacked up in different configurations and consolidated to produce composite plates. Tensile testing samples were cut-off from these plates and tested according with ASTM D 3039 standards. Our data evinces that the use of the manufacturing procedure described here allows for the production of high mechanical performance thermoplastic composites reinforced with long, continuous and aligned fibers.

Poster 095

INFLUENCE OF THE STACKING SEQUENCE ON THE MECHANICAL PROPERTIES OF GLASS/SISAL HYBRID COMPOSITES

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This study evaluates the mechanical properties of sisal/polyester, glass/polyester and hybrid sisal/glass/polyester composites, as a function of the fiber layer stacking sequence. The aim of this hybridization is to combine the advantages of natural and synthetic fibers. Tensile, flexural and impact tests were carried out as per ASTM standards. Hardness tests were also done. The composites were compression molded varying the sequence of a total 8 layers of glass and sisal fibers. It was shown that the combination of sisal fibers with the glass fibers originated a material of intermediate properties and, depending on the type of loading and stacking sequence, it may show properties very close to the pure glass fiber composites.

Poster 096

MISCIBILITY AND MECHANICAL AND THERMAL PROPERTIES OF GELATIN/CASEIN FILMS CROSSLINKING WITH 1-ETHYL-3-(3-DIMETHYLAMINOPROPYL) CARBODIIMIDE HYDROCHLORIDE

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Blends based on gelatin/casein crosslinked with 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide hydrochloride (EDC) were prepared in different proportions and analyzed in terms of miscibility, thermal stability (in inert or air atmosphere) and mechanical properties. The thermomechanical analysis showed only one glass transition temperature value for each composition suggesting miscibility between the two proteins. The low tensile strength values obtained suggested that the crosslinking process contributes to the destabilization of the proteic net. The Young modulus suggested that the blends presented less rigidity (more flexibility) than the pure proteins. The thermal degradation obtained in N_2 atmosphere revealed only one stage of mass loss as in air atmosphere presented three. The presence of more stages of mass loss under air degradation indicated the decomposition of oxidative products of gelatin/casein/EDC formed during the heating process.

Poster 097

STUDIES ON POLYPROPYLENE/CELLULOSE MICROFIBER COMPOSITES

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In this work composites of Polypropylene homopolymer (PPh), Polypropylene copolymer (PPc), and microfibers of cellulose were produced with and without compatibilizing agent. The interfacial behaviour of these composites was studied using torque rheometry, tensile tests and scanning electron microscopy (SEM). Torque values indicated that the maleic anhydride grafted polypropylene (PP-MAH), used as compatibilizing agent, indicated a different interaction with each matrix studied. Addition of cellulose microfibers leads to a slight increase in the tensile strength and modulus for the copolymer composites, whereas for the homopolymer a decrease was observed. In the latter one an improvement on this behaviour could be obtained only by using PP-MAH. The elongation was decreased significantly in all composites SEM showed that PP-MAH seems to improve adhesion for some systems, consistent with torque rheometry results.

Poster 098

POLYPROPYLENE / TALC COMPOSITES

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Polypropylene (PP)/talc composites were prepared by melt processing in a twin screw extruder. The mechanical and thermal properties of the composites were determined by using the ASTM standard procedures. The influence of the talc content and the screw rotor speed on the PP properties were investigated by using an experimental design. The response variables studied were melt flow index (MFI), impact resistance and yield strength. The talc content was the most significant processing variable. It was found that in general, the addition of talc to a polypro-