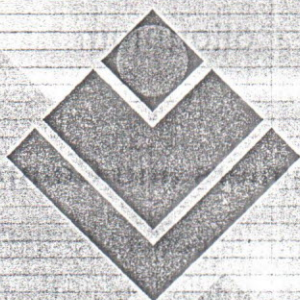


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# Oral Contributions

## Oral 01

### RHEOLOGICAL CHARACTERIZATION OF POLYMER SOLUTIONS FOR OILWELL DRILLING APPLICATIONS

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Offshore drilling and completions are high cost operations which require careful design for technical and logistic issues to enhance the profitability of a field development project. Fluids play a major role in the process and rheology is one of the key factors to be addressed. Considering the diversity of functions and applications of such fluids, a tailor made rheological design is a big challenge. The main goal of this article is to present a broad rheological characterization of different polymeric solutions with potential use for the desired application. The following polymers were tested under shear and extensional flows: Partially hydrolyzed polyacrylamide (PHPA), Xhantam gum (XC), Carbopol and Poly Ethylene Oxide (PEO),% in a 50 wt % Poly ethylene Glycol (PEG) solution.

Different polymers showed totally different rheological responses in the 3 different rheometric flows studied. This variety constitutes a powerful tool for drilling fluid design aiming different applications. Experimental results highlight the good pseudoplastic and gelation properties of XC polymers, normally used as drilling fluids. PEG+PEO and PHPA presented relevant extensional and normal stress responses.

## Oral 02

### INTERFACIAL BEHAVIOUR OF COMPOSITES OF RECYCLED POLY(ETHYLENE TEREPHTHALATE) AND SUGAR CANE BAGASSE FIBERS

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In this work composites of recycled Poly(ethylene terephthalate) (PETr) and sugar cane bagasse fibers were produced with and without compatibilizing agents. The interfacial behaviour of these composites was studied using torque rheometry, tensile tests and scanning electron microscopy (SEM). Comparing the compatibilizing agents ethylene/n-butyl acrylate/glycidyl methacrylate copolymer (EBGMA) and a copolymer of ethylene and methyl acrylate (EMA), the torque values indicated that EBGMA increased the interaction between the constituents more effectively than a EMA. Addition of bagasse sugar cane fibers kept the tensile modulus and reduced the tensile strength and elongation of PETr, as usually observed for these types of composites. SEM showed that EBGMA improved adhesion between the constituents, consistent with the results of torque rheometry. All the composites showed a nice visual aspect and could be a good alternative to produce ecologically friendly products.

## Oral 03

### PS / POSS NANOCOMPOSITES

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In this study, the influence of POSS in PS nanocomposites has been studied evaluating the effect POSS-cage structure on morphological, thermal, and thermomechanical properties. Nanocomposites were prepared in an internal mixer by loading POSS into the polymeric matrix at different weight ratios ranging from 0.25 to 10 wt%. Several techniques were employed for nanocomposites properties evaluation, such as X-ray diffraction, Scanning electron microscopy and Dynamic-thermomechanical analyses. The results had shown a sub-micrometric dispersion of POSS nanofillers into the PS matrix. Changes in glass transition temperature were also detected. Besides, the nature of POSS-cage outer R-groups plays a major role in macro-phase segregation.

## Oral 04

### MORPHOLOGICAL AND PHYSICAL-CHEMICAL CHARACTERIZATION OF CHITOSAN/ASTAXANTHIN MICROPARTICLES

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Microparticle of chitosan with astaxanthin encapsulated was prepared. The morphological characteristics were examined using a scanning electron microscope (SEM). The SEM micrographs show a non-homogeneous size and a diameter of 33-52 µm, with a rather smooth surface. The FTIR spectra of microparticles indicating a formation of an astaxanthin-chitosan complex. The thermal degradation

properties of pure chitosan; astaxanthin oil and chitosan/astaxanthin microparticle was studied by thermogravimetric analysis under nitrogen atmosphere. The results showed that chitosan present two stages of decomposition, astaxanthin oil one stage and chitosan/astaxanthin microparticle three stages of thermal decomposition. DSC results indicate that glass transition temperature of chitosan shift to lower value in microparticle due to plasticizing effect of astaxanthin oil.

## Oral 05

### MECHANICAL PROPERTIES OF ELASTOMERIC NANOCOMPOSITES WITH "IN SITU" GENERATED CELLULOSE NANOFIBERS

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Regarding the decreasing supply of conventional resources and therefore the increasing prices the application of products containing materials from renewable resources is of growing interest worldwide. Cellulose, as one of the most abundant natural polymers, is a cheap and easy assessable alternative to petroleum based filler types. For thermoplastics cellulose microfibrers are state of the art, whereas for elastomers the technical grades show less strengthening effects due to their morphology. To compete with carbon black or silica nanometer scale cellulose fibers are necessary. The materials properties of NBR-Cell 2 nanocomposites processed via the recently developed dynamical co-coagulation process demonstrate an enhancement in comparison to conventional filled materials. Experiments with the variation of the cellulose content, acid concentration and pressure demonstrate an optimum in the materials properties for a given combination of process parameters. Materials with an optimal set of parameters are showing a strengthening effect even with low cellulose contents compared to conventional filled systems with carbon black.

## Oral 06

### THERMAL CHARACTERIZATION AND DEGRADATION OF PHBV-G-MA/ LIGNOSULFONATE COMPOSITES

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The aim of this work is to characterize some thermal properties and the thermoxidative degradation profile of a composite produced by grafting of maleic anhydride onto PHBV (PHBV-g-MA) and mixing of this modified PHBV with lignosulfonate. The results shows some dependence on the maleic anhydride content in the weight loss evolution and an endothermic event occurred in all samples studied at 170 °C attributed to melting of PHBV. The exothermic reactions observed by DTA are related to reactions occurred between the sample and oxidative atmosphere just before the formation of char residues.

## Oral 07

### ESTERS AND POLYESTERS PRODUCED IN SOLUTION FROM UNSATURATED FATTY ACIDS

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Methyl esters obtained from olive, sunflower and linseed oils have been epoxidized with performic acid in situ. Different molar fractions of the obtained epoxy-esters (EE) were reacted with cis-1,2-cyclohexanedicarboxylic anhydride in the presence of triethylamine (TEA) as initiator. Some reactions were performed with addition of a small amount of 1,4-butanediol diglycidyl ether (BDGE). The infrared, 13C and 1H NMR spectra show that the structures of all reactions products are very similar, but with different morphologies (as observed by Polarized Optical Microscopy). The thermograms obtained by Differential Scanning Calorimetry (DSC) show melting points in the range between 170 and 190 °C.

## Oral 08

### BIODEGRADABLE COMPOSITES BASED ON STARCH FOAM REINFORCED BY NATURAL FIBERS

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The use of polymers for packaging has increased a lot during last decade. The disposal of these post-consuming packages has become a problem to be solved