Application of cellulose in rubber nanocomposites

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Products obtained from renewable resources are deserving growing interest due to the worldwide discussion of sustainability[1]. The purpose of this work is to describe the influence of the process and the rubber/cellulose ratio on the properties of different nanocomposites. The nanocomposites were obtained by co-coagulation of rubber latex and cellulose xanthate mixtures employing three different procedures, one dynamical[2] and the other two static[3-10]. Nanofibers are obtained by the dynamic process[2] and nanoparticles by the static ones[3-10]. The properties of these nanocompounds are compared with the ones obtained with conventional carbon black and with industrially used cellulose grades filled rubber compounds. The extensive research and development work devoted to nanocomposites have already resulted in new grades and products. Nevertheless, still great efforts are being undertaken to improve the dispersion and distribution of different materials at the nano scale. There is a promising option with the water-mediated technique being an elegant way to overcome the problem[11]. So, the co-coagulation of rubber latices and water-soluble cellulose derivatives opens a new possibility to obtain cellulose containing elastomeric nanocomposites with tailorized properties. The properties of the vulcanized materials are analyzed by physico-mechanical, optical and morphological characterization.

Key words: cellulose, nanocomposites, rubbers, elastomers, latex.

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