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The effect of hydrolyzed cellulose pulp as a filler for LPDE

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The non-edible nature of cellulose, its abundance as available material in the form of wood or agriculture residues and its renewable character makes this natural polymer an interesting material to be used as environmental friendly reinforcement filler for conventional polymers. The cellulose fibers due to their mechanical characteristics can improve the mechanical behavior of current polyolefins (e.g. PP, PE) if enough interaction between structures is provided. Besides improving the polyolefins performance, depending on the degree of incorporation, cellulose fibers could also accelerate the biodegradation process of these materials. Much of the works described the use of cellulose in the forms of micro-fibrillated or nano-cellulose which is kind of cellulose much more expensive than cellulose pulp used in paper production. Taking into account the possible industrialization of this type of reinforcement, it is important to get a much more available kind of cellulose starting as close as possible from native cellulose. In this work, we hydrolyzed cellulose pulp using sulphuric acid method to a powder form and prepared mixtures of this material with Low Density Polyethylene (LDPE) in order to evaluate the effect on the mechanical properties. Homogeneous mixtures were achieved even with 30% of cellulose incorporation. The effect of amount of cellulose and the presence of commercial compatibilizers on the mechanical properties of the composites will be described.

Biography

Jorge F J Coelho has completed his graduation from the Faculty of Science and Technology, University of Coimbra, Portugal, in Chemical Engineering. In 2006, he has completed his PhD from the University of Coimbra working on new reversible deactivation radical polymerization methods for vinyl chloride. He is an Assistant Professor with aggregation at the University of Coimbra. He has co-authored 131 peer-reviewed research papers, 11 book chapters and 2 granted international patents. His research interests include reversible deactivation radical polymerization, bio-based and biodegradable polymers, novel pharmaceutical products, supra-molecular chemistry and scale-up approaches for reversible deactivation radical polymerization.

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