All cellulose acetate composites

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Composites are made of two or several components assembled in a single structure. Polymer composites are classically prepared with a polymer matrix reinforced by polymer fibres having properties different from the ones of the matrix, searching for a synergy in order to reach composites properties better than the individual components. In most cases, there is a need to improve the adhesion of the two polymers. Many strategies have been used for this, either by chemically or physically treating the reinforcing polymer or adding a coupling agent [1]. An elegant way to avoid having an interface difficulties is to use the same polymer for both the matrix and the reinforcing filler. These composites are called "All polymer composites" [2]. The first work on all cellulose composites was published in 2004 [3]. Since then, many papers appeared exploring the various strategies for mixing a cellulose matrix with cellulose fibres or nano-fibres [4].

We are reporting here our attempts to prepare all cellulose acetate composites. One preparation method was tested, a melt route where cellulose acetate fibres are mixed with a molten cellulose acetate matrix. This preparation method produced composites with improved mechanical properties.

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