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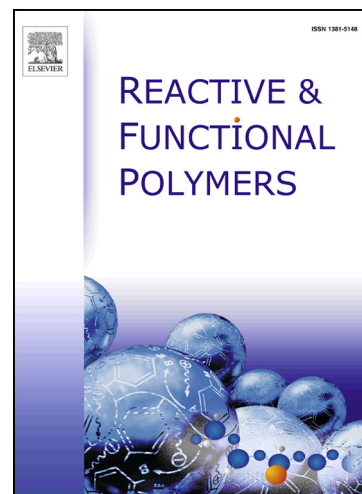
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Cross-linking of cellulose and poly(ethylene glycol) with citric acid

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ABSTRACT. A novel approach to modifying native cellulosic fibres with poly(ethylene glycol) (PEG) impregnation and simultaneous cross-linking by citric acid (CA) was investigated. To understand the contributions of different components in the system, control references with just CA and cellulosic fibres (filter paper) were studied. The effect of sodium hypophosphite as a catalyst was also assessed. The results revealed that ester bonds are indeed formed in the cellulose-PEG-CA reaction system, as indicated by weight percentage gain (WPG) and FTIR analysis. The best results were achieved by using 5% CA and 10% PEG (calculated as weight-% from cellulose). In the reaction, the environmentally friendly CA prevents PEG from being leached out of cellulose during washing, resulting in promising future applications in dimensionally stabilized products based on cellulosic fibres.

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