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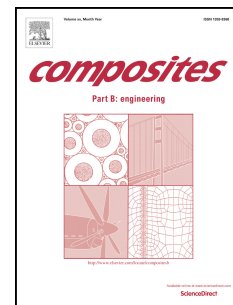
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Rheological behaviour of cork-polymer composites for injection moulding

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Abstract

The incorporation of cork in synthetic polymers has become an effective approach to develop new sustainable materials. Cork-polypropylene composites (CPC) filled with three different cork granulometries were studied. Rheological analyses were performed to assess the processability of these CPC and a set of experiments was conducted keeping the same matrix/cork weight ratio, varying the cork granulometric distribution. The effect of three different cork granulometries, temperature and the effect of a coupling agent, polypropylene graft maleic anhydride (PPgMA), were analysed. All composites exhibited non-Newtonian, pseudoplastic behaviour. Related to neat PP, cork incorporation led to a viscosity increase. This increase is more significant in the CPC with the lowest powder cork granulometry used. On the other side, the addition of PPgMA resulted on a decrease of CPC viscosity. The experimental results were fitted to Cross-WLF Model through a viscosity master curve obtained by the time-temperature superposition principle (TTSP). This study showed that cork can be considered on the development of sustainable materials for injection moulding technology.

Keywords

A. Polymer-matrix composites (PMCs)

A. Thermoplastic resin

B. Rheological properties

E. Injection moulding

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