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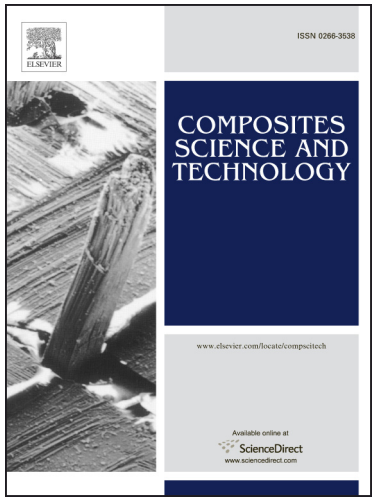

Rheology and Conductivity of Carbon Fibre Composites with Defined Fibre Lengths

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Rheology and Conductivity of Carbon Fibre Composites with Defined Fibre Lengths

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Abstract

Rheological and electrical properties of polymer composites containing conductive fillers are influenced not only by the total content of the filler but also by the shape and dimensions of filler particles markedly. However, separate treatment of these two effects is often not feasible in composites prepared by melt mixing as the filler concentration affects the flow behaviour of the melt and, thus, has an effect on the final particles geometry. In this work, composites with polymethylmethacrylate matrix and short carbon fibres with defined lengths independent on the fibre concentration were prepared and their rheology and the electrical conductivity were investigated. A pronounced influence of the fibre length on the rheological and electrical properties of the composites was confirmed. Increasing the length of the fibres the rheological quantities were affected more significantly and simultaneously the percolation threshold was shifted to lower fibre volume fractions.

Keywords: A. carbon fibres, A. polymer-matrix composites, B. electrical properties, D. rheology

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