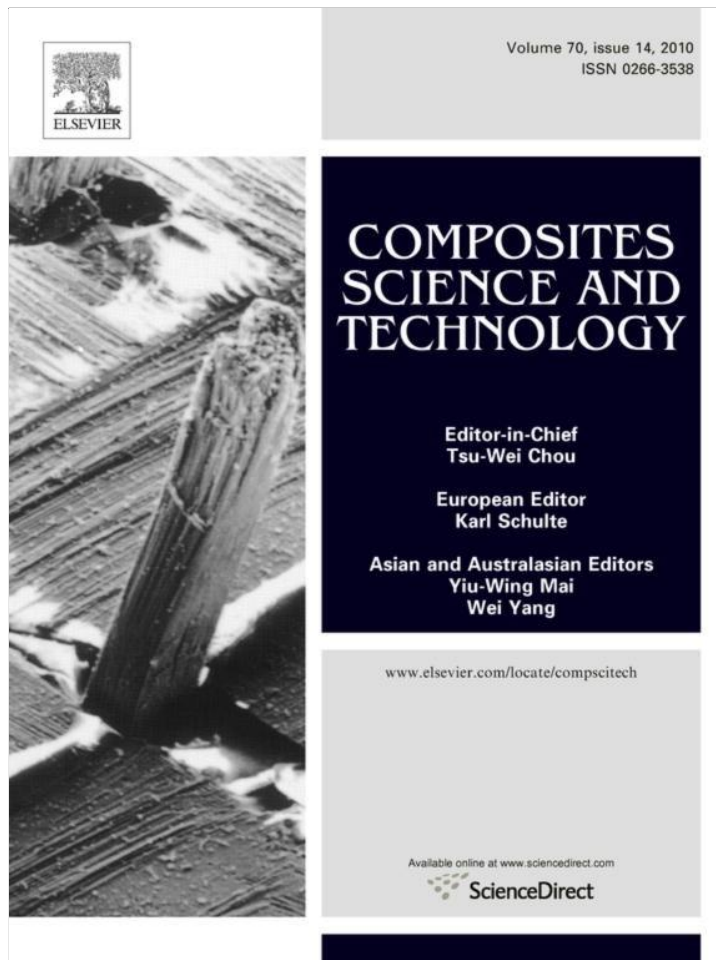


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## Polyethersulfone-expanded graphite nanocomposites: Charge transport and impedance characteristics

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### abstract

Polyethersulfone (PES)-expanded graphite nanocomposites have been prepared by solution blending route after sonicating expanded graphite in dichloromethane. It has been observed that ultrasonication results in nanosheets formation leading to a low percolation threshold of 3 wt.%. At 5 wt.% filler loading the conductivity is of the order of  $10^{-2}$  S/cm. Hopping type of charge transport occurs at 3.2 wt.% expanded graphite in PES below which capacitive effects couple. The effective dielectric constant at low frequency increases with filler concentration. Impedance measurement has been carried out to evaluate interfacial capacitance which, for 3.2 wt.% expanded graphite addition in PES, increases to 110 pF from 32 pF for 1 wt.% expanded graphite in the polymer. DSC analysis shows an increment of 12 °C in the  $T_g$  of PES with 3 wt.% expanded graphite suggesting interaction between the polymer and filler.

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