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CONDUCTIVE POLYMER NANO-COMPOSITES

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ABSTRACT

We report about the development of electrically conductive polymer nano-composites by mixing different graphite powders (carbon blacks, C-fibres and carbon nanotubes) with various polymers. Injection moulded polymer composites were analysed by electrical measurements, dielectric impedance, electromagnetic shielding, dynamo-mechanical analysis, and electron microscopy. The normal correlation between the electrical conductivity and the EMI shielding was registered. The shielding efficiency was enhanced by combination of different fillers in the same polymer matrix. The highest value of the shielding was 32 dB, measured for the complex composite material PBT + CNT + graphite. For 20 wt% CNT filled materials conductivities up to 1 S/cm have been measured. The alteration of the mechanical properties at high contents of fillers was improved by using CNT as filling material, for which a minimal impact on the mechanical properties was measured.