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Effect of electrophoretic condition on the electromagnetic interference shielding performance of reduced graphene oxide-carbon fiber/epoxy resin composites

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Abstract

Reduced graphene oxide modified carbon fiber (rGO-CF) was synthesized by electrophoretic deposition and chemical reduction. The GO concentration, electrophoretic time and voltage were taken as variables. Epoxy based composites (rGO-CF/EP) were prepared through molding process and the effects of electrophoretic condition on electromagnetic interference (EMI) shielding performance of rGO-CF/EP were studied. Scanning electron microscopy (SEM) and Fourier transform infrared (FTIR) spectroscopy showed that rGO nanosheets were successfully immobilized on CF. The shielding effectiveness (SE) of composites was tested, and the electrophoretic time and voltage have positive impact on SE value. When the voltage increased to 21 V for 60 min, the rGO-CF/EP composite obtained maximum EMI SE of 37.6 dB, which had a 47.6% improvement than that of CF/EP. Furthermore, a high calculated

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