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The enhancement effect of carbon-based nano-fillers/polyaniline hybrids on the through-thickness electric conductivity of carbon fiber reinforced polymer

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Abstract

Overall goal of this research is to study the conductivity enhancement effect and its mechanism for different types of carbon-based nano-fillers/conduct polymer hybrids in carbon fiber reinforced polymer (CFRP). Multi-walled carbon nanotubes (MWCNT)/polyaniline (PANI) and graphene oxide (GO)/PANI hybrids were separately dispersed into divinylbenzene (DVB) to make the CFRP composites. The alternating current (AC) electrical conductivity results show that both, the binary MWCNT/PANI and GO/PANI hybrids have significant enhancement on AC conductivity, while MWCNT/PANI gives better improvement over GO/PANI hybrids. The mechanism for the conductivity enhancement was studied by SEM, XRD, UV-Vis and nanoindentor. Circuit models were proposed. The maximum AC

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