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**Simultaneous enhancement of electrical conductivity and mechanical properties
in Buckypaper-reinforced polydivinylbenzene(doped polyaniline) composites**

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Abstract

The key barrier to design conductive polymer composites with maintained mechanical performance is to increase the content of conductive nanofillers with well-dispersity in the polymer matrix. Here we report new buckypaper (BP) reinforced polydivinylbenzene (PDVB)/doped polyaniline (DPANI) composites with significant improvement in both electrical and mechanical properties. The composites have been fabricated through a positive-pressure filtration method which features high loading of well-dispersed oxidized MWCNTs. The electrical conductivity and the elastic modulus of the BP reinforced composites were found to be 11.56 and 6.88-times improved, respectively, compared to the native PDVB(DPANI). The enhancement mechanism is explained by the formation of electrical transport pathways and an extensive molecular-level interaction between BP and DPANI. The enhancement effect has also been confirmed by comparing the experiment result with

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