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**The decoupling electrical and thermal conductivity of fullerene/polyaniline hybrids  
reinforced polymer composites**

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**Abstract**

Hybrid nanoparticles, fullerene (C<sub>60</sub>) and polyaniline (PANI), were incorporated into the polydivinylbenzene (PDVB), and their decoupling effect of electrical and thermal conductivity was investigated. The hybrid particles were fabricated through simple one-step process in the solution of divinylbenzene (DVB) monomer. The morphology and structure were characterized by TEM, SEM and FTIR. After the incorporation of C<sub>60</sub>/PANI hybrids into DVB monomer, the electrical conductivity was improved significantly while the thermal conductivity was reduced simultaneously, resulting in effectively decoupling thermal/electrical conductivity. The AC electrical conductivity increased from  $9 \times 10^{-10}$  S/m to 63.7 S/m at the frequency of 1Hz, more than 10 orders of magnitude. On the contrary, the thermal conductivity was reduced to extremely low of

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