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Highly thermal conductive composites with polyamide-6 covalently-grafted graphene by an *in situ* polymerization and thermal reduction process

Peng Ding
Shanghai University, P R China

The thermal conductive polyamide-6/graphene (PG) composite is synthesized by *in situ* ring-opening polymerization reaction using ε-caprolactam as the monomer, 6-aminocaproic acid as the initiator and reduced graphene oxide (RGO) as the thermal conductive filler. The generated polyamide-6(PA6) chains are covalently grafted onto graphene oxide (GO) sheets through the "grafting to" strategy with the simultaneous thermal reduction reaction from GO to RGO. The homogeneous dispersion of RGO sheets in PG composite favors the formation of the consecutive thermal conductive paths or networks at a relatively low GO sheets loading, which improves the thermal conductivity (λ) from 0.196 $W.m^{-1}.K^{-1}$ of neat PA6 to 0.416 $W.m^{-1}.K^{-1}$ of PG composite with only 10 wt% GO sheets loading.

Biography

Peng Ding has completed his PhD in Polymer Chemistry and Physics from University of Science and Technology of China (USTC). His research interest is mainly focused on the Polymer Chemistry and Polymer Nanocomposites. He has published more than 50 papers, applied for 37 Chinese patents (17 authorized), and was awarded the First Shanghai Science and Technology Progress Prize and the Second Shanghai Science and Technology Progress Prize, China.

dingpeng@shu.edu.cn

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