

**In-situ growth CNTs/graphene on carbon fabrics to enhance
mechanical and thermal properties for tribological applications
of carbon fabrics/phenolic composites**

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Abstract

Nanocarbon materials (CNTs/graphene) were in situ grown on carbon fabrics by chemical vapor deposition to improve the tribological properties of carbon fabrics-reinforced phenolic composites. Results showed that the thermal conductivity and tensile strength of the modified composites were enhanced, respectively, owing to the high thermal conductivity of nanocarbon materials and the improved interfacial adhesion between carbon fabrics and resin matrix. nanocarbon-grafted composites exhibited a greater wear resistance than nanocarbon-free composites; this can be attributed to the improved interfacial bonding of the composites by the incorporation of nanocarbon materials. Therefore, grafting CNTs/graphene on carbon fabric is an effective method to improve the thermal, mechanical, and tribological properties of carbon fabrics-reinforced phenolic composites. Most importantly, the carbon fabrics/phenolic composites reinforced by CNTs/graphene hold a great potential in producing high-performance polymer composites for tribological application.