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Electrophoretic Deposition of Graphene Oxide on Continuous Carbon Fibers for Reinforcement of both Tensile and Interfacial Strength

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Abstract: Carbon fiber reinforced composites have been attracting increasing attention due to their excellent mechanical properties. However, the interfacial properties of carbon fiber composites tend to be weak because carbon fibers naturally show a weak wettability and adsorption with most polymers matrix. Here, we proposed a method to improve the interfacial properties of carbon fiber composites together with the tensile strength of carbon fiber. Briefly, a layer of graphene oxide (GO) was deposited on continuous carbon fibers by electrophoretic deposition in isopropyl alcohol under ultrasonic treatment. After treatment at 150 °C, the tensile strength of carbon fibers and the interfacial shear strength (IFSS) of carbon fiber/epoxy composites were enhanced by 34.58% and 69.87%, respectively. This method is believed to have applications in continuous production of high-performance carbon fiber composites.

Keywords: A. Carbon fiber, A. Graphene oxide, A. Interfacial properties, B.

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