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**Interfacial microstructure and mechanical properties of carbon fiber composites by fiber surface modification with poly(amidoamine)/polyhedral oligomeric silsesquioxane**

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**Abstract:** Polyhedral oligomeric silsesquioxane (POSS) was grafted onto carbon fiber surface using poly(amidoamine) (PAMAM) as a novel coupling agent at mild reaction conditions. Firstly, the reinforcement was designed with propagation of PAMAM on the fiber surface by in situ polymerization to improve the surface activities of carbon fiber. Secondly, the POSS further grafted on the fiber could significantly enhance fiber surface energy and wettability, which would greatly increase the interfacial strength of fiber-matrix. The microstructure and mechanical properties of carbon fiber and the resulting composites were investigated. The results indicated that PAMAM and POSS, which could significantly increase the surface roughness and wettability of carbon fiber, were successfully grafted on the fiber surface. Compared

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