

Surface treatment effect of three-dimensional carbon fillers for improving the thermal property of epoxy composites

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Because thermally conductive three-dimensional carbon fillers have high specific area, small amount of fillers easily form a network between neighbors. However, curvy three-dimensional carbon fillers are hard to be completely filled with polymers at the filler/polymer interfaces, resulting in the formation of micro/nano pores within the composite. Thus, excellent thermal property of carbon fillers couldn't manifest within the polymer composite. Herein, self-assembled monolayer (SAM) was introduced on the surface of three-dimensional carbon fillers to enhance the wettability between carbon fillers and epoxy matrix. Owing to the extremely thin thickness of the SAM, interfacial resistance between carbon filler and epoxy matrix was minimized and thermal conductivity of the carbon filler/epoxy composite was enhanced.