

Effect of Different Types of Nano/Micro Fillers on the Interfacial Shear Properties of Polyamide 6 with De-Sized Carbon Fiber

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Abstract : The current study aims to investigate the effect of fillers with different geometries and sizes on the interfacial shear properties of PA6 composites with de-sized carbon fiber. The fillers which have been investigated are namely; nano-layer silicates (nanoclay), sub-micro aluminum titanium (ALTi) particles, and multiwall carbon nanotube (MWCNT). By means of X-ray photoelectron spectroscopy (XPS), epoxide group which defined as a sizing agent, has been removed. Sizing removal can reduce the acid parameter of carbon fibers surface promoting bonding strength at the fiber/matrix interface which is a desirable property for the carbon fiber composites. Microdroplet test showed that the interfacial shear strength (IFSS) has been enhanced with the addition of 10wt% ALTi by about 23% comparing with neat PA6. However, with including other types of fillers into PA6, the results did not show enhancement of IFSS.

Keywords : sub-micro particles, nano-composites, interfacial shear strength, polyamide 6

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