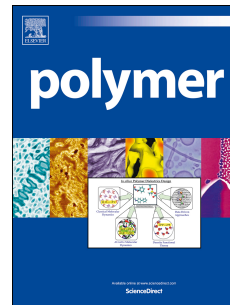


Accepted Manuscript

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PII: S0032-3861(14)00364-4

DOI: [10.1016/j.polymer.2014.04.052](https://doi.org/10.1016/j.polymer.2014.04.052)

Reference: JPOL 16951

To appear in: *Polymer*

Received Date: 11 March 2014

Revised Date: 22 April 2014

Accepted Date: 28 April 2014

Please cite this article as: Puch F, Hopmann C, Morphology and tensile properties of unreinforced and short carbon fibre reinforced Nylon 6/multiwalled carbon nanotube-composites, *Polymer* (2014), doi: 10.1016/j.polymer.2014.04.052.

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Morphology and tensile properties of unreinforced and short carbon fibre reinforced Nylon 6/multiwalled carbon nanotube-composites

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Abstract

The morphology and the tensile properties of unreinforced and short carbon fibre (SCF) reinforced Nylon 6/multiwalled carbon nanotube (MWCNT)-composites are investigated. The morphology analysis shows that MWCNT and SCF are randomly oriented in the composites. Furthermore, the SCF fail due to fibre pull-out, while the MWCNT fail due to fracture. Young's modulus and tensile strength of SCF reinforced Nylon 6 and Nylon 6/MWCNT-composites increase with increasing total filler volume content. Replacing SCF by MWCNT further enhances Young's modulus and the tensile strength. An additive modelling approach leads to better results at low MWCNT-volume contents, while at higher MWCNT loadings a multiplicative modelling approach results in a better approximation of the experimental data. Thus the SCF reinforced Nylon 6/MWCNT-composites behave at low MWCNT-volume contents like

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