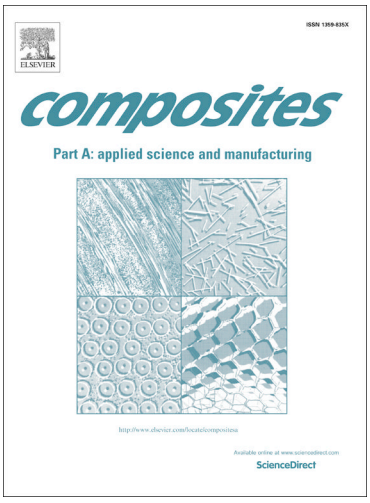

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PII: S1359-835X(17)30345-7
DOI: https://doi.org/10.1016/j.compositesa.2017.09.016
Reference: JCOMA 4785

To appear in: *Composites: Part A*

Received Date: 12 July 2017
Revised Date: 19 September 2017
Accepted Date: 23 September 2017

Please cite this article as: Zhou, S., Hrymak, A.N., Kamal, M.R., Electrical, morphological and thermal properties of microinjection molded polyamide 6/multi-walled carbon nanotubes nanocomposites, *Composites: Part A* (2017), doi: https://doi.org/10.1016/j.compositesa.2017.09.016

Electrical, morphological and thermal properties of microinjection molded polyamide 6/multi-walled carbon nanotubes nanocomposites

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Abstract: A series of polyamide 6/multi-walled carbon nanotubes (PA6/CNT) nanocomposites were prepared using a masterbatch dilution process, followed by microinjection molding of a part with a three-step decrease in thickness along the flow direction. Morphology observations revealed that there was a preferential orientation of CNT in the flow direction, which is attributed to the prevailing high shear rates in μIM. The distribution of CNT after melt processing was evaluated by dissolving experiments. Additionally, the correlation between electrical resistivity and development of microstructure for each section of the microparts was considered. The thermal behavior of PA6/CNT nanocomposites and corresponding microparts was evaluated using differential scanning calorimetry. Results indicated that the addition of CNT had little effect on the melting behavior of PA6/CNT nanocomposites and corresponding microparts. However, the crystallization behavior was changed significantly and a double crystallization peak was observed for samples incorporating CNT.

Keywords: A. Polymer-matrix composites (PMCs); B. Microstructures; D. Thermal analysis; E. Injection molding

1. Introduction

The pursuit of high performance polymer/carbon nanotubes (CNT) nanocomposites has

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