

Accepted Manuscript

N-phenyl Maleimide Grafted MWNT/Bismaleimide-Allyl Bisphenol A Nanocomposites: Improved MWNT Dispersion, Resin Reactivity and Composite Mechanical Strength

Wang Chong, Liu Lin

PII: S0167-577X(17)30198-2

DOI: <http://dx.doi.org/10.1016/j.matlet.2017.02.014>

Reference: MLBLUE 22116

To appear in: *Materials Letters*

Received Date: 25 October 2016

Revised Date: 1 January 2017

Accepted Date: 6 February 2017

Please cite this article as: W. Chong, L. Lin, N-phenyl Maleimide Grafted MWNT/Bismaleimide-Allyl Bisphenol A Nanocomposites: Improved MWNT Dispersion, Resin Reactivity and Composite Mechanical Strength, *Materials Letters* (2017), doi: <http://dx.doi.org/10.1016/j.matlet.2017.02.014>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



N-phenyl Maleimide Grafted MWNT/Bismaleimide-Allyl Bisphenol A Nanocomposites: Improved MWNT Dispersion, Resin Reactivity and Composite Mechanical Strength

Wang Chong^{1,2,*}, Liu Lin² (* Corresponding author, Dr. Wang Chong, Email: mecwang@connect.hku.hk)

(¹Department of Mechanical Engineering, The University of Hong Kong, Hong Kong)

(²School of Material Science and Engineering, Tongji University, Shanghai)

Abstract: Due to the high thermal resistance property and low moisture absorption, bismaleimide (BMI) resin has gained great interests in aerospace industries. However, materials made of pure BMI resin often encounter high brittleness and relatively low mechanical strength. In this investigation, N-phenyl maleimide (N-PMI) functional groups were grafted to acidified multi-walled CNTs (MWNT-COOH) to form MWNT-N-PMI through a series of grafting including the Michael addition reaction. MWNT-N-PMI can be uniformly dispersed in BMI/allyl bisphenol A (BMI-BA) resins only with a hand stirring. The addition of N-PMI-MWNT enhanced the reaction activity of BMI-BA resin and mechanical properties of N-PMI-MWNT/BMI-BA composites was significantly higher than that of BMI-BA reinforced by MWNT-COOH.

1. Introduction

Carbon nanotubes (CNTs) have been widely used as the reinforcement of polymers for engineering applications such as aerospace engineering [1]. However, these applications have been restricted due to severe CNT aggregation. To solve this issue, appropriate CNT surface modification is needed. For thermoplastics, CNTs are often grafted with polymer chains to alleviate the CNT sedimentation and aggregation. By contrast, for thermosets, excellent CNT dispersion and uniform distribution should be achieved before the pre-polymers are cured/crosslinked. Since most monomers/pre-polymers of thermosets are small molecular compounds, the dispersion of CNT in these liquefied environments can be achieved by grafting micromolecular functional groups which are structurally similar to the monomers/pre-polymers to the CNT surface. To date, high performance

Download English Version:

<https://daneshyari.com/en/article/5463305>

Download Persian Version:

<https://daneshyari.com/article/5463305>

[Daneshyari.com](https://daneshyari.com)