

Accepted Manuscript

Hindered phenol functionalized graphene oxide for natural rubber

Lin Zhang, Hongqiang Li, Xuejun Lai, Wenjian Wu, Xingrong Zeng

PII: S0167-577X(17)31355-1

DOI: <http://dx.doi.org/10.1016/j.matlet.2017.09.027>

Reference: MLBLUE 23141

To appear in: *Materials Letters*

Received Date: 20 July 2017

Revised Date: 28 August 2017

Accepted Date: 4 September 2017

Please cite this article as: L. Zhang, H. Li, X. Lai, W. Wu, X. Zeng, Hindered phenol functionalized graphene oxide for natural rubber, *Materials Letters* (2017), doi: <http://dx.doi.org/10.1016/j.matlet.2017.09.027>

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.



Hindered phenol functionalized graphene oxide for natural rubber

Lin Zhang ^a, Hongqiang Li ^{a*}, Xuejun Lai ^a, Wenjian Wu ^b, Xingrong Zeng ^{a*}

^a *College of Materials Science and Engineering, South China University of Technology, No 381,*

Wushan Road, Tianhe District, Guangzhou 510640, People's Republic of China

^b *School of Environment and Civil Engineering, Dongguan University of Technology, No 1, Daxue*

Road, Songshanhu District, Dongguan 523808, People's Republic of China

* Corresponding authors: E-mail: hqli1979@gmail.com (H. Li); psxrzeng@gmail.com (X. Zeng)

ABSTRACT: Hindered phenol functionalized graphene oxide (HPFGO) was prepared by grafting 2, 6-Di-tert-butyl-4-hydroxymethyl phenol (DBHMP) onto graphene oxide (GO) using isophorone diisocyanate as bridging agent. FT-IR, XPS, XRD and TGA results confirmed the chemical structure of HPFGO. By latex-mixing method, HPFGO was uniformly dispersed in natural rubber (NR) matrix and obviously enhanced the thermal stability. Importantly, HPFGO significantly improved the thermo-oxidative aging resistance of NR vulcanizate, which was attributed to not only the synergistic antioxidative effect between hindered phenol and urethane groups, but also the barrier role of HPFGO sheets to oxygen.

KEYWORDS: Hindered phenol; Graphene oxide; Nanocomposites, Thermal properties, Thermo-oxidative aging resistance

1. Introduction

Due to the presence of unsaturated double bonds and active allylic hydrogens, natural rubber (NR) easily undergoes thermal oxidation attack when being stored and used. Generally, the most convenient way is to add antioxidant. However, traditional antioxidants including aromatic amines

Download English Version:

<https://daneshyari.com/en/article/5462640>

Download Persian Version:

<https://daneshyari.com/article/5462640>

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