

Accepted Manuscript

Low percolation threshold in flexible graphene/acrylic polyurethane composites with tunable negative permittivity

Haikun Wu, Yuanyuan Qi, Zhongyang Wang, Wen Zhao, Xiaomin Li, Lei Qian



PII: S0266-3538(17)31417-3

DOI: [10.1016/j.compscitech.2017.08.011](https://doi.org/10.1016/j.compscitech.2017.08.011)

Reference: CSTE 6866

To appear in: *Composites Science and Technology*

Received Date: 13 June 2017

Revised Date: 2 August 2017

Accepted Date: 10 August 2017

Please cite this article as: Wu H, Qi Y, Wang Z, Zhao W, Li X, Qian L, Low percolation threshold in flexible graphene/acrylic polyurethane composites with tunable negative permittivity, *Composites Science and Technology* (2017), doi: 10.1016/j.compscitech.2017.08.011.

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.

Low percolation threshold in flexible graphene/acrylic polyurethane composites with tunable negative permittivity

Haikun Wu¹, Yuanyuan Qi², Zhongyang Wang¹, Wen Zhao¹, Xiaomin Li¹, Lei Qian^{*1}

¹Key Laboratory for Liquid-Solid Structural Evolution and Processing of Materials (Ministry of Education), Shandong University, 17923 Jingshi Road, Jinan 250061, China

²Shandong University of Traditional Chinese Medicine, 16369 Jingshi Road, Jinan 250061, China

*Corresponding author, E-mail: qleric@sdu.edu.cn;

Tel : +86-531-88393396

Haikun Wu and Yuanyuan Qi contributed equally to this work.

Abstract

Graphene (GR)/acrylic polyurethane (APU) composites with low percolation threshold and tunable negative permittivity were prepared by coating and pressing method. The microstructures and dielectric properties including alternating current conductivity (σ_{ac}), reactance (Z'') and permittivity (ϵ' and ϵ'') were investigated in detail. A percolation phenomenon from σ_{ac} was observed when the GR content was increased from 0.9 to 6 vol%, and the percolation threshold was 1.8 vol%. The percolation threshold was obviously lower than those from the reported carbon/silicon nitride, carbon nanotube/phenolic resin and GR/phenolic resin composites, which was possibly attributed to the well dispersion and unique microstructure of GR in APU. Moreover, the negative permittivity was obtained from the much lower GR content

Download English Version:

<https://daneshyari.com/en/article/5022283>

Download Persian Version:

<https://daneshyari.com/article/5022283>

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